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SPACE SYSTEMS DIVISION

AIR FORCE SYSTEMS COMMAND

22 December 1961

FOREWORD

This Abbreviated Program Plan presents the elements of Program 662A which is the accelerated development of the Standardized Agena D space vehicle. This document has been prepared in response to Hq USAF Secret message AFSDC-F 82340 dated 30 November 1961. Achievement of the tasks outlined in this plan will meet the requirement for a more reliable standardized basic space vehicle capable of performing essential ascent and/or orbital functions for a large number of DOD space programs.

The directed phase of this program includes the development of twelve flight vehicles and one development test vehicle to be subsequently used for product improvement. It is contemplated that information derived and capabilities established during this initial program will result in a sufficiently well defined vehicle to permit a fixed price contract to be negotiated for production of Agena D vehicles up to a rate of five per month.

O. J. RITLAND
Major General, USAF
Commander

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PART I - PROGRAM SUMMARY

1.0 BACKGROUND INFORMATION:

a. On 30 June 1961 Amendment No. 1 to Letter Contract AF 04(647)-800 authorized the Agena Standardization Study. Sufficient study was accomplished to indicate that singleness of functional design prevails for those components which are necessary to perform ascent functions. The degree of extension of these components functionally to accomplish on-orbit requirements is a pecularity of each program.

b. In the study conducted the feasibility of placing a Standard Agena into final design and production was established. All programs were canvassed throughout all systems and subsystems. All functions were assembled and categorized -- common and non-common. All functions were compared with equipment capabilities and equipments were selected having common functional capabilities. Modifications, minor in nature necessary to other equipments were determined. All individual program requirements were assembled and categorized such as life, power, attitude, altitude, etc.

c. A design compatible airframe was conceived, a mockup was constructed, and mission common components were installed. Provisional space was set aside for mission peculiar functions and related components. Thus, a single vehicle, basically simple in design, and meeting all program requirements was established. This vehicle has built-in adaptability for advanced components without change in basic design of structure. A modular concept is employed in addition for flight and mission equipment. Vehicle equipment has not been co-mingled with payloads and payload peculiar equipment or with additional vehicle equipment necessary for a particular mission.

d. For the simple high-performance ascent type mission only a limited amount of equipment need be carried. For program systems where Agena is used on orbit additional equipments are loaded in spaces where provisions have been made for these equipments. When not required, the equipment and its wiring harnesses may be left out.

e. To date, the Agena has been designed, engineered, and produced on an experimental basis as an R&D item for use on military satellite systems. In most cases there have been "block type" releases of three or four vehicles of a particular configuration to satisfy mission requirements of an R&D nature. In no case to date has there been identification of vehicle or mission in operational terms. Design for production on a line basis with the associated standard requirements for uniform installation of certain equipment and provision for additional special equipment has not been practiced. Also each vehicle, because of its narrow configuration orientation, has not had the advantages of design for accessibility, maintainability, reproducibility, or interchangeability. These refinements, more common to production items, were not considered either economical nor feasible. Neither were they considered compatible with schedule requirements. Contractual arrangements further inhibited wide spread generalization of vehicle requirements, hence standardization has not heretofore been a subject for serious consideration.

f. Times have changed as has been pointed out above. The use of Agena is expanding and the numbers to be considered are ample enough to require that the vehicle be engineered for production. The experience and know-how accumulated over the past three years coupled with the results of the recent study add to the desireability and practicability of standardization.

g. Results of the study proved a standard Agena to be feasible and on 25 August 1961 Letter Contract AF 04(695)-21 was awarded to LMSC authorizing the development and manufacture of twelve (12) "Standard Agena" flight vehicles with a first launch programmed for January 1963.

h. On 17 October 1961, the Honorable Dr. Joseph V. Charyk, Under Secretary of the Air Force, appointed the following committee to investigate certain aspects of the Agena Satellite Program:

Mr. Clarence L. Johnson, Chairman

Dr. Abe M. Zarem

Dr. James A. Marsh

Major Henry C. Howard

The verbal directive from Dr. Charyk to the group stated that under special urgency it should "investigate ways and means for improving the reliability of the Agena vehicle and recommend improved procedures for getting the standardized Agena D into earlier operation". On 25 October 1961, the report of the committee was submitted recommending acceleration and listing the conditions which would have to be granted to LMSC in order to meet the earlier launch date.

i. On 1 November 1961, the Air Force requested LMSC to submit, as soon as possible, a budgetary price proposal, work statement and plan for the accomplishment of the accelerated Agena D Program based on the conditions set forth in the Johnson Committee Report.

j. On 7 November 1961, Dr. Charyk, General B. A. Schriever and party met with Lockheed officials to review the proposed program. The result was an immediate "go-ahead". The program was immediately initiated by LMSC with Mr. F. W. O'Green as Program Director. On 17 November 1961, the budgetary proposal, work statement and plan was presented to Dr. Charyk in Washington, D. C. A firm price proposal was submitted on 15 December 1961.

1.1 PRIME OBJECTIVES

a. The prime objectives of the accelerated Agena D program are twofold.

1. To produce a more reliable standardized basic vehicle capable of performing essential ascent and/or orbital functions derived from common

mission requirements of the following programs: Discoverer, 201, [redacted] 101B, 102, Midas, 621-A, NASA, Advent, Vela Hotel and Boss. Detailed design objectives shall include accessibility, maintainability, producibility and shall make maximum use of already qualified Agena B components. The standardized vehicle shall be capable of performing these missions without major structural modifications.

2. To provide a fixed price procurement source for Agena vehicles.

1.2 DETAILED OBJECTIVES

a. The detailed objectives of the accelerated Agena D program shall be:

1. To create a fast-reaction, streamlined organization for design and production of Agena D vehicles.

2. To eliminate "red tape" and formal procedures to permit much shorter time span between design, procurement and manufacturing.

3. To establish production facilities capable of producing five vehicles per month. Initial effort shall be accomplished in present facilities with the eventual capability being attained in a new building.

4. To establish an acceptable cost accumulation plan that will be suitable for cost plus incentive fee and fixed price contracts.

5. To design the Agena D system in the shortest practical time and at the lowest practical cost commensurate with achieving mission

adaptability, high reliability, ease of maintainability, increased serviceability, producibility, lower production costs, reduced checkout requirements and better performance.

(a) Mission Adaptability. All of the requirements of known missions will be studied to arrive at the most efficient standard Agena configuration. The final design will meet the performance requirements of all using programs at least to the extent that the present Agena B vehicle does with regard to weight, structural, and thermal performance. In addition, it will have the advantages of lower cost and higher reliability.

(b) Reliability. A primary objective of the program will be the production of a high reliability design and product. The objective is a 90% reliability for launch and ascent missions and a high reliability for up to 10 day orbital life missions. A reliability program plan will be prepared and submitted following, in general, the requirements of MIL-R-27542. A highly qualified reliability department will be established to monitor parts selection, preliminary design, design releases, design reviews, trouble and failure reporting, and training and improvement programs.

(c) Serviceability. Increased serviceability of the Agena D is one of the primary design objectives. Faulty components will be easily detected by the standard checkout procedures and all components will be easily accessible for replacement on a black box level. Faulty components can be quickly replaced from field stock and the failed component returned to the factories or the vendor for repair.

(d) Checkout Requirements. Checkout procedures will be streamlined and automated so that long set-up times will not be required anc complex data reduction requirements will be eliminated. Components will be tested thoroughly during the receiving inspection. At the subsystem level the tests will not impose any requirements on the components not previously tested at the component level. In the complete system checkout, no subsystem or component will be subjected to any test not covered in earlier tests. However, the final system checkout will be thorough and will assure that all components and systems are operating in accordance with mission requirements.

(e) Production Costs. New production costs will be obtained by designing to reducing final assembly time, introducing the module concept, eliminating numerous flush screws and fastners, eliminating requirement for painting ascent vehicles, relaxing smoothness requirements, relaxing squareness and alignment tolerances, integrating instrumentation into related equipment, standardizing booster electrical interface and reducing wiring.

(f) Performance Improvement. Engineering required for reliability and performance improvements will include study and design effort to produce hardware at lower cost, lighter weight, and simplified design. This will include the introduction of HI-REL parts, elimination of non-standard parts, standardization of assembly and installation procedures, standardization of the wiring harness, simplification of equipment and wiring installations, critical appraisal of new or modified equipment and improved electrical grounding.

6. To establish an early design freeze necessary to meet present delivery requirements.

7. To provide engineering capability to accomplish initial design, provide sustaining engineering, and conduct desirable evolutionary improvements in the Agena D.

8. To prepare and deliver to the Air Force, adequately detailed specifications suitable for vehicle acceptance and procurement purposes.

1.3 PLAN FOR ACCOMPLISHMENT OF OBJECTIVES

a. First Prime Objective. In order to provide at the earliest possible time Agena D vehicles for use in the Discoverer flight program, the following actions are, or will be, accomplished by the Contractor and/or Air Force as appropriate.

1. The Johnson Committee basic ground rules will govern the development of the Agena D. See Part II, Page II-1.

2. An organization plan (See Part II) has been created to match the referenced basic ground rules under the Agena D Program.

3. Highly qualified Air Force and contractor personnel have been transferred to the new organization and the work area has been closed to all except authorized personnel.

4. Since optional equipment hardware will not be furnished under this program and since mission peculiar equipment development and hardware is managed by the using programs, procurement of most services will close with the transfer of the Agena D vehicle to the using program. Modification and development of in-plant AGE/STE required to support optional equipments will be procured by the using program. Launch complex AGE will not be developed or modified under the Agena D contract and mission peculiar coordination and analyses will be the responsibility of the using program.

5. Using program liaison has been established as a staff function consisting of five men under Systems Engineering and Reliability.

This staff will keep the Agena D organization continually informed as to all using program engineering requirements in order to insure maximum adaptability in the Agena D system design. This staff will also keep the using program offices up to date on the Agena D design and capabilities of the Agena D to insure maximum compatibility between the Agena D vehicle and using program requirements.

6. A master schedule has been prepared covering the vehicle master schedule, program milestones, contract milestones, reports and data requirements schedule, detailed schedules for test programs, design, material procurement and manufacture of the vehicle. These schedules will be monitored, refined and reported, as required. Daily internal red flag reports are being issued to highlight problem areas.

b. Second Prime Objective. In order to accomplish a five per month production rate of Agena D vehicles at lower costs and eventual creation of a fixed price source of procurement for Agena vehicles, the following plans have been or will be implemented by the contractor:

1. Production Plan Agena D vehicles will eventually become production line units. As such built-in attributes of economy, producibility, reliability and ease of serviceability will result Value engineering concepts will be employed. Appropriate product improvement by block development concept, on a regular schedule compatible with production schedules, will also be accomplished.

(a) The DTV and twelve Agena D flight vehicles will be built using a mixture of minimum tooling and rate tooling and streamlined supporting functions The rate tooling will be phased in as it becomes available. Minimum tooling techniques will be used at the outset to insure early vehicle available.

(b) Checkout of the DTV and twelve Agena D vehicles will be accomplished by systems test using manually operated test equipment, however, LMSC shall design and provide semi-automatic factory checkout equipment to support a five per month production rate.

(c) In support of a build-up in manufacturing to a five per month production rate, the following policies will be adhered to by LMSC:

(1) The engineering drawing structure will be developed within the scope of the Manufacturing Plan and will follow the existing LMSC system as prescribed in LMSC Drafting Practice Manual. First article engineering release will be pre-negotiated by FAMSCO (First Article Master Schedule Committee) to establish an overall program which shall be accomplished within the target dates of the Master Schedule. All engineering changes after the FAMSCO negotiations will be negotiated by the Design Change Board to incorporate the change in the affected vehicle in the most efficient and orderly manner.

(2) In general, Production Planning Procedures, as presently established, will be followed for the Agena D program. Planning will work concurrently with Engineering during the development and

maintenance phase of engineering in defining the sequence and content of assemblies to be called out on the drawing structure and to insure the producibility of parts and assemblies.

(3) Quantity and rate of production, size and complexity of parts and availability of equipment and facilities will be considered in developing the most economical method of manufacturing. The quality and type of tooling ordered will be based upon consideration of the total quantity of parts to be procured, design stability and the individual characteristics of the part. Machine parts tooling will be simplified by the reduction of multiple operation to be accomplished by a single tool in accordance with economical and efficient shop loading. Multiple usage of fabrication tools will be utilized to the fullest extent. Fabrication tools will be of the type to minimize assembly time and to meet interchangeability and replaceability requirements.

2. Procurement Plan. The procurement objective shall be to provide accelerated procurement service under the Agena D contract with the capability to provide complete isolation of Agena D procurement costs. Not all procurement actions will be accomplished by LMSC Agena D procurement personnel, but they will have the responsibility to insure that all procurement activities are accomplished. In support of this plan:

(a) The LMSC Agena D Procurement Manager has staffed his organization with the necessary qualified personnel. The organization structure is constituted to obtain maximum advantage of existing resources.

(b) Procurement personnel will work directly with technical personnel to establish material requirements.

(c) Raw materials, miscellaneous small parts, small dollar value parts and outside production services will be procured on purchase orders through the existing General Procurement Organization.

(d) Equipment items, subcontract items, and peculiar parts will be procured by the LMSC Procurement Organization on Agena D purchase orders to established requirements.

(e) Material and subcontract cost status will be maintained.

(f) Receiving and Stores functions will be performed within LMSC by the General Service organizations.

(g) Maximum use will be made of existing procurement capabilities, lines of authority, established policies and customer procurement system approval.

(h) Agena D purchases will be given special treatment, will be distinctively marked and will carefully isolate their peculiar costs.

3. Inspection Plan

(a) The initial system, including procedures, will be adjusted to suit the development phase of Engineering, Manufacturing, and Procurement. Engineering and Manufacturing accumentation for this program will be to minimum development requirements consisting mostly of red-lined drawings, sketches, pre-release design, shop orders, and other similar documents. Inspection will accept such minimum requirements as inspection criteria provided the format and documentation is adequately clear and complete.

(b) Inspection will be conducted throughout the manufacturing process to assure continuous control of quality of parts, components, sub-assemblies and final assemblies including all testing. A system will be maintained for recording all inspection and tests. Receiving Inspection and acceptance testing of parts and materials will be performed in accordance with present applicable policies and procedures. Raw material will, when practical, have a test report or certification of conformance identifiable with the material. In the event no such report or certificate is available, samples shall be taken and be tested to determine that the material conforms with the procurement specification. The inspection system will provide for the prevention and ready detection of discrepancies and permit timely and positive corrective action.

(c) Tool Inspection will assure the accuracy of all jigs, fixtures, or other such devices used for manufacturing and for inspection purposes. Use of IR's (Inspection Rejection) will be held to a minimum. In the event an item must leave the area, i.e., rework at vendor, an IR will be written and processed in accordance with applicable

LMSC policy. The existing LMSC Measurement Standards Laboratory will be utilized to assure that measing and testing equipment conform with contract requirements. As the program moves forward, better documentation incorporating all necessary inspection audit points and a minimum statistical control system will be maintained.

(d) The production phase will begin during the development period providing for the extension of all facets of applicable quality assurance and test services into a practical application for follow-on contractual responsibilities, i.e., MIL-Q-9858.

(e) LMSC will prepare detail model specifications, test specifications, and procedures to permit production (five vehicles per month) and acceptance and use of the basic Agena D. The specifications and procedures shall be delivered to the Procuring Agency no later than 1 April 62. Drawings and component specifications will be provided as requested. The Agena D specification program shall provide all of the specifications for a complete procurement data package. The specifications and procedures package shall provide technical information adequately defining acceptance criteria for Air Force Quality Control personnel. LMSC will prepare performance specifications for the manual and automatic system test complexes and submit them to the procuring agency for approval. Upon approval by the procuring agency, the contractor shall comply with the provisions of the subject specification.

4. Accounting and Cost Accumulation Plan. In order to provide

a cost accumulation system which will insure a clear segregation of program costs consistent with the requirements of CPIF and Fixed Price contracting, and to provide a budget and control system which will clearly indicate budget status in relation to schedule accomplishment, the following plan will be implemented:

(a) Accounting Plan

(1) A simplified work order structure has been developed, incorporating minimum segregations of engineering, testing, tooling, fabrication, and assembly. Primary emphasis has been placed on the meaningful segregation of manufacturing costs to provide a sound basis for future Fixed Price quotations. Manufacturing costs will be broken down to vehicle segments and manufacturing activity controlled within those segments.

(2) The present LMSC labor classification policy will be continued so that LMSC overhead rates will be applicable to this project. Such functions as procurement, contracts, price estimating and budgeting will be carried as indirect.

(3) In order to provide the requisite isolation of costs for this program, a separate contract inventory has been established in lieu of utilizing the SSD parent inventory. Not only will this enhance the control of this inventory for the contract, but it is consistent with the fact that the program will be located in an isolated area.

(4) The timekeeping under this program should be relatively simple in that the personnel assigned to the program will devote their efforts to one contract and that contract will have a simplified work order structure. It is presently planned to include within the Program office a representative of the Air Force Auditor General's Office who will continually review the manner in which the various organizations are charging their effort to make sure that there exists compatibility with the outlined work order structure.

(5) In order to minimize costs and to take advantage of existing LMSC facilities, such routine functions as accounts payable, payroll, and contract cost ledger accumulations will be performed by the LMSC finance organization.

(6) A study has been commenced with an implementation goal of 1 July 62 to evolve a manufacturing-oriented cost system which will place emphasis on labor productivity analysis, material control, parts costs, change control, shop spoilage, etc.

(7) Consistent with the premise of achieving a high degree of autonomy, a study has been completed with respect to participation in existing manufacturing, quality control, and SSD labor pools. A modified participation in those pools has been evolved in accordance with the degree of utilization anticipated. No pools will exist in the Agena D organization itself.

(8) Overhead costs applicable to Agena D will be accumulated into a separate overhead rate. This will be accomplished on a schedule to be established between the ACO and the contractor.

(b) Budget and Control Plan

(1) Inasmuch as the 662A Program will be isolated within LMSC, budgeting of the Agena D organization will be relatively simple. Internal budgets will be established, published and reported against in a timely manner, so that each LMSC organization manager will be completely aware of his budget status. Furthermore, those LMSC organizations outside of the Agena D organization who will be devoting effort to the program will likewise be surveilled in a strict manner. Each outside organization will be held fully accountable for the costs which they charge to this program and unexplainable excesses will be charged back.

(2) The Air Force and LMSC Program Directors will be provided with timely reports as to to-date costs and completion estimates for comparison with the negotiated price. Such comparison estimates will be related to the schedule position, so that there will be the necessary tie-in between effort expended to date and the schedule attainment.

(3) Initial budgets are based on contractor ROM estimates and have been released through the month of December. Upon

completion of the definitive quote on December 15, 1961, the complete program budget will be revised and released.

(4) It is planned that fiscal reporting will be kept to a minimum. All fiscal reports will be submitted on the DD-1097 format.

(5) See Part V for detailed Fiscal Planning information.

5. Logistics Support Plan

(a) Spares in support of Manufacturing, as well as spares designated for Logistics support after DD 250, will be accounted for by LMSC. Designated spares will be withdrawn by Agena D Manufacturing and physically stored in the Agena D Manufacturing area. Logistics spares will be provisioned and controlled by LMSC Space Systems Logistics, in conformance with a spares philosophy set forth by the LMSC Agena D Program office.

(b) Spares will be made concurrently with production line items on the Agena D contract. They will be subject to an aggregate dollar ceiling in order that the items and their quantity can be modified as dictated by additional insight and experience.

(c) Air Force and contractor Agena D Program office personnel will jointly act as a provisioning team to determine the spare items to be provisioned. LMSC Agena D engineering will insure that the drawing breakdown is consistent with these items and with the manufacturing and test sequence. LMSC Space Systems Logistics will determine required quantities of logistics spares. Spare Parts Requirements will be prepared and released to Agena D Manufacturing for LMSC fabricated spares. Requests to Purchase will be prepared and released to LMSC Agena D Procurement for purchased and subcontract spares. Listings of spares will be submitted to AFPRO concurrently with release to purchasing office or internal fabrication. Review by AFPRO may result in a recommendation for readjustment of listings. (Logistics personnel performing the above functions will be supported by Agena D sharing appropriately on a prorata basis in the Logistics pool charge.)

(d) Logistics spares, either manufactured or procured by Agena D, will be delivered to the central Logistics storage and distribution system, at which point the responsibility of the Agena D Program ceases. This system will be supported by the using program. The apportionment and distribution of the Logistics spares to using programs will be the responsibility of the Air Force and LMSC Logistics.

(e) LMSC Agena Systems Engineering will determine where various items are removed, replaced, and repaired. The policy will be that black boxes and like components are removed/replaced at the launch bases and at Sunnyvale, but they will be repaired as determined by the MRB. For example, a fairing may be repaired at Sunnyvale and an inverter may be repaired at Engineered Magnetics.

LMSC Space Systems Logistics will provision under the Agena D contract, spares needed for repair of Agena D equipment. The actual repair activities will be handled under separate contractual action supervised by LMSC Space Systems Logistics.

6. Test and Checkout Plan

(a) Manufacturing Test Plan The Manufacturing Test Plan will use as its base those receiving functional tests conducted either by Inspection at LMSC or the vendor at his own plant, verified by LMSC and Air Force Inspection surveillance. Manufacturing testing will be subjected to a continuous process of surveillance to reduce testing by keeping test redundancies to a minimum. Each component will be tested as early in the process as feasible and proper allowance will be made for the "funnel of tolerances" in checkout equipment as functional components are processed through the line. These components when further assembled into modules will be passed through module test stations for the purpose of calibration and alignment of that module.

(b) Final Acceptance Systems Test. During the initial phase of Agena D production the Final Acceptance Systems Test (FAST) will be conducted on a Manual complex assembled for this purpose. FAST on later Agena D's will be conducted using the Factory Agena Checkout Equipment (FACE) test complex which is a semi-automatic checkout station utilizing as a basic tool an AN-GJQ-9 Programmer Comparator. The vehicle checkout equipment will have the capability of determining malfunction down to the replacement module/component level. Functional maintenance of the vehicle at FAST will be restricted to replacement of functionally interchangeable units and failed units will be returned through manufacturing to either the vendor or the module station for further failure determination and repair.

7. Facilities (See Part IV for details.)

PART II - PROGRAM MANAGEMENT

2.0 SUMMARY

a. This plan establishes the principles for implementation of Air Force Program 662A and shall apply to personnel directly assigned to the program and to personnel performing support functions pertaining thereto. By mutual agreement, both the contractor and the Air Force will comply with the rules of operation defined herein.

b. In general, the channels to be utilized in the management of Program 662A are essentially those already in existence for the management of designated systems. It must be recognized, however, that the objectives which have been established for the program cannot be accomplished in the time specified unless extraordinary treatment is given to Command decisions.

c. The following basic rules will apply to Program 662A:

(1) A DX priority is assigned to the Agena D Program.

(2) The engineering system shall be simplified, requiring only those drawings essential to tool, build and service the vehicle.

(3) 50% final configuration freeze shall be accomplished by 1 December 1961.

(4) Engineering and management level personnel for Program 662A shall be located in an exclusion area immediately adjacent to the tooling and manufacturing area.

(5) A rapid drawing release system (24 hours maximum) from the project engineer's approval to the manufacturing group shall be established.

(6) Funding shall be adequate and timely.

(7) Technical directive meetings involving large groups shall not be required. Air Force personnel shall work in close liaison with the LMSC Project Engineer so formal meetings are not required.

(8) Reasonable overtime will be approved. After-the-fact approval is not precluded. (Pursuant to clause A-37 of the contract.)

(9) Air Force approval of vendor selection shall be furnished on-the-spot at Sunnyvale. When single source procurement is necessary, justification of such action will be kept on file.

(10) Tooling shall be of the simplest type that will achieve interchangeability as stated in the basic Agena D specification. No tool drawings or outside approval of tooling will be required.

(11) Interchangeability on early Agena D's will be limited to major structural and equipment items. Doors, for instance, may require trim to fit.

(12) The AF Director, Program 662A, and the LMSC Program 662A Director shall jointly review the specification problem and agree at the configuration conference to reduce the number involved to the

minimum compatible with the minimum requirements for the construction of the Agena D.

2.1 PROGRAM MANAGEMENT CHANNELS

a. Higher Echelons. At each echelon in the command channel, a specific individual must be designated as Program 662A Action Officer. These individuals must be properly indoctrinated with the priority of the 662A Program and must be given authority to act for the Commander as necessary, to satisfy the requirements of the program. The technique of "management by exception" must be employed in order to afford Program 662A personnel the freedom to concentrate on the task to be accomplished. Attachment 1 is a suggested Command Channel diagram.

b. Program Office. Air Force Office organization and personnel are depicted on Attachment 2. The organization is configured to accomplish both contract administration and engineering tasks. The function of each organizational element is as follows:

(1) Director 662A -- Responsible for the overall Air Force management, (plans, organizes, coordinates, controls and directs), the efforts of functional agencies and industries participating in the 662A Program.

(2) Deputy for Programming, Procurement and Production -- Responsible to the Director, 662A Program for programming, procurement and production of the Agena D and its supporting AGE/STE.

(a) Programming Branch -- Responsible for establishing Agena D program requirements based upon the official Air Force Integrated Launch Schedules published by SSD; providing budget information to program offices pertaining to fund requirements for Program 662A and for availability of funds for release to the contractor.

(b) Procurement and Production Branch -- Responsible for all aspects of the preparation, negotiation, definitization, release and management of contracts for Agena D, and responsible for production schedules for Agena D vehicles, optional equipment and spare parts; for Agena D production progress surveillance; for facilities, inspection and acceptance.

(3) Assistant to Director for Engineering -- Responsible to the Director 662A Program for planning, implementing, and surveillance over the engineering of the Agena D and its supporting AGE/STE.

(a) Aerospace Ground Equipment Branch -- Responsible for the Air Force management of contractor's engineering efforts during the design, development and test of Agena D Aerospace ground equipment and special test equipment to insure the technical adequacy and timely delivery of the equipment to support Air Force programs. Also responsible that vehicle test philosophy and procedures and the checkout equipment are compatible and will during vehicle tests, provide adequate technical data to permit acceptance of the Agena D vehicle.

(b) Electronics Branch -- Responsible for the Air Force management of contractor engineering efforts during the design, development, and test of Agena D guidance and control and electrical power requirements to insure the technical adequacy and timely delivery of the equipment to support Air Force programs.

(c) Astro Vehicle Branch -- Responsible for the Air Force management of contractor engineering efforts during the design, development, and test of Agena D structures and propulsion systems to insure the technical adequacy and timely delivery of the equipment to support Air Force programs.

c. Relationship with AFPR

(1) In recognition of the urgency attached to the satisfactory accomplishment of subject program, it is mutually understood that extraordinary and unusual technical and contractual relationships will be required. Consistent with the principle that the design, manufacture, and test of the end article within the critical program schedule can only

be achieved through an unencumbered working relationship of engineering, procurement, inspection, manufacturing, logistics and support personnel, both the Air Force and LMSC Program Directors will have authority to make "on-the-spot" decisions both technical and contractual. With respect to contract administration, specifically identified tasks will be monitored by selected individuals as set forth in Attachment 4, Memorandum of Understanding between the SPD and the AFPR.

(2) The LMSC engineering and management personnel will be located in an exclusion area in Building 151, immediately adjacent to the final assembly and checkout (Attachment 3). The 662A Air Force Program Office will be located adjacent to this Agena D area in the exclusion area. Access to this Air Force office is available to using Program personnel from both LMSC and the Air Force without interfering with the LMSC Agena D effort. Liaison with the LMSC Agena D activity, by and on behalf of the Air Force and contractor personnel during the contract period, will be confined to a limited number of designated personnel who shall have free access to the entire activity at all times. Air Force access will be restricted to the 662A Program Office personnel and designated personnel from the AFPR Office. No other Air Force personnel, other than those specifically approved by the Air Force or LMSC Program Director, will be permitted access to the Agena D exclusion area.

(3) The resources of the Air Force Plant Representative Office will be utilized on a streamlined basis in carrying out contract administration functions to assure satisfactory execution of the Agena D Program. Acting for and under the control of the Director, Program 662A, the AFPR will make decisions relative to the 662A Program which are binding upon the contractor. Selected individuals from the AFPRO have been designated contact personnel for their responsible functional areas. These designated individuals will have free access to USAF Program 662A personnel and access to the exclusion area as necessary to perform the task assigned. The Memorandum of Understanding between the SPD and the AFPR (Col Voyles) is attached as Attachment 4.

d. LMSC Management Organization

(1) The contractor has placed the full support of the Corporation behind the Agena D Program. Within the LMSC Space Systems Division, he has established the Agena D Directorate, with broad and all-encompassing authority. This authority includes full control over operations which are normally organized on a plant-wide functional basis, including manufacturing. The LMSC Agena D Program Director's organization is charted in Attachment 5 and his functions and responsibilities are as follows:

(a) Basic Objectives: Develop, design and manufacture the Agena D vehicle, establishing management controls over all aspects of the Agena D program contract.

(b) Functions and Responsibilities

1. Serve as the principal representative of Space Systems Vice President and General Manager with the customer in negotiations and commitments for the Agena D Program.

2. Perform the complete systems engineering and reliability function for the Agena D Program, including the direction and control of all systems design, flight sciences, and test planning.

3. Perform all vehicle engineering for the Agena D Program, including all subsystem design for airframe and installations, propulsion, internal electrical systems, guidance and control, and selected communications and control equipment.

4. Design or provide the technical direction for the design of Agena D checkout equipment. Perform Agena D systems tests.

5. Manufacture of the Agena D vehicle, including electrical structure, and final assembly in accordance with Agena D drawings and specifications. Provide production planning, tooling, and production control. Direct and control any manufacturing services required by the program.

6. Plan, establish and maintain an effective inspection system to provide compliance with the contractual and design requirements of the Agena D program.

7. Establish a procurement system to provide for the analysis of material requirements, the procurement of material, control of inventories, and the receiving, storing and distributing of incoming shipments.

8. Establish and maintain a management control system encompassing both program controls and administrative controls for the Agena D Program.

(2) In addition to the foregoing responsibilities which have been delineated and agreed upon, the following will be established as firm requirements of LMSC relative to the management of the Agena D Program.

(a) The Contractor shall operate and maintain a logistics system which will ensure the availability of spare parts and the repair of generated reparables.

(b) The accounting system will provide for the segregation and reporting of basic vehicle development, product improvement, and logistics costs.

2.2 PROCEDURES

a. Fiscal Procedures: See PART V

b. Relationship with Other Programs

(1) The Agena D Program has been established with the premise that only a minimum of effort not directly associated with the Agena D development will be required. The transfer of data to using programs is a necessary part of implementation of the Agena D Program and, therefore, an Agena D liaison group has been established with LMSC. This group is to act as the central point of information flow into and out of the Agena D technical area. To assist them, certain documents will be published and kept current. These include an advanced vehicle description, vehicle inboard profiles and layouts, and system and subsystem schematics. The design studies and analyses which are generated during the course of development and reported by in-house documentation shall also be available. The liaison group shall then have the responsibility of coordination with interested programs, receipt of their data requirements, and transfer of the available documentation as is necessary to fulfill their requirements. The AF Agena D Program Office shall also act as a line of communication for those programs desiring information or contact with the LMSC liaison group. Normal practice shall be that data requests to specific format shall not be honored, however, distribution of in-house documents which contain the desired information shall be made as they become available.

c. Reporting Procedures

(1) One of the basic criterion to the expediting of the Agena D Program was the necessity that reports and data requirements be kept to an absolute minimum. Consistent with such a philosophy, Program 662A personnel must have access to the management controls to be utilized by LMSC personnel in the management of the Agena D Program. The Program 662A personnel, for instance, will attend the weekly program review meetings held by the LMSC Program Director. In turn, no specific periodic report will be submitted to higher headquarters by the Program Office. In lieu thereof, a status presentation will be given when deemed necessary by the Program 662A Director or requested by higher headquarters. It is intended, however, the Program Office will maintain a data file Program 662A in the general format required by the Systems Data Presentations and Reporting Procedures.

d. Product Improvement

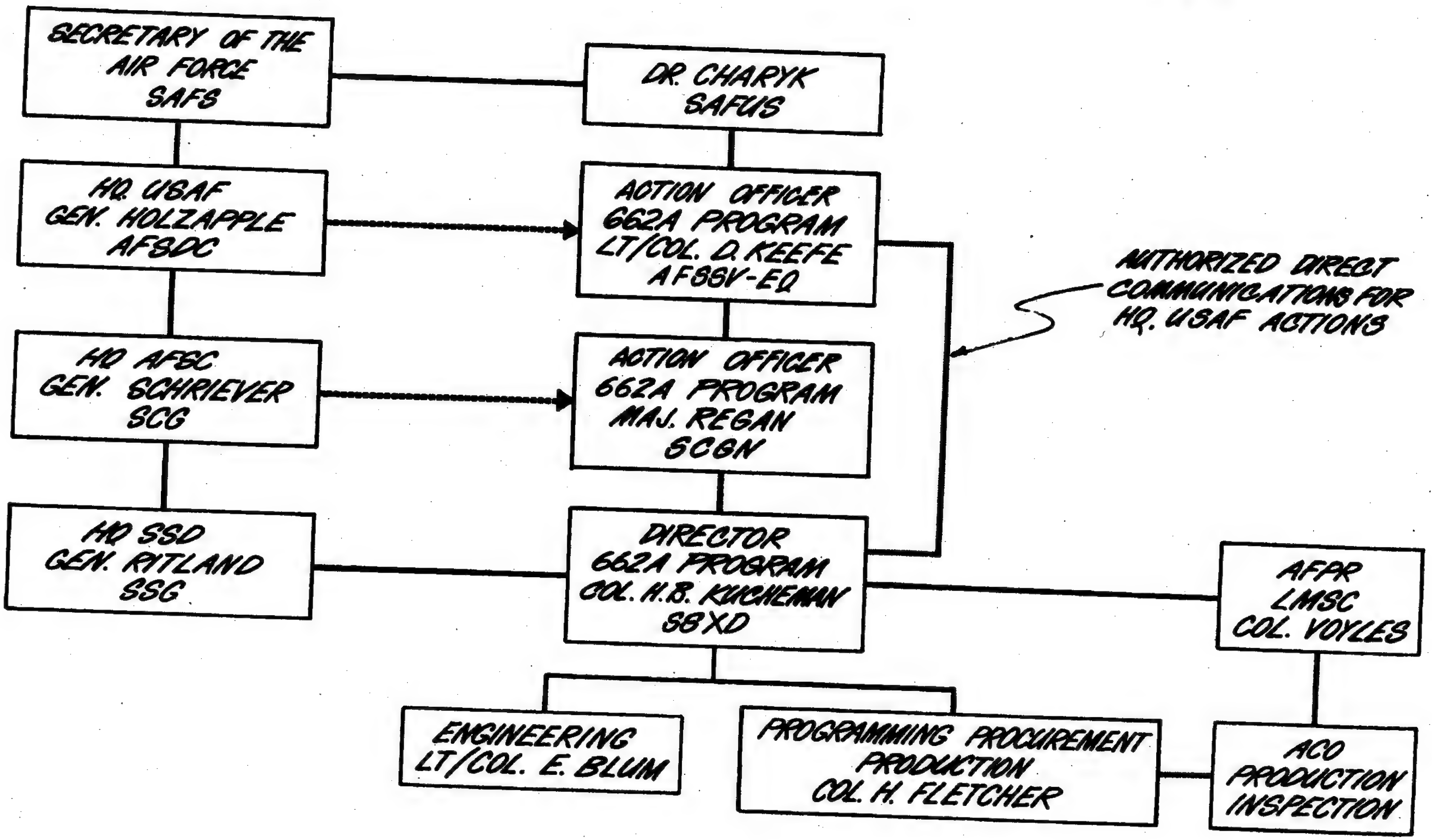
(1) After the initial effort in designing the Agena D, a follow-on provision will be made for a product improvement. A limited level of effort will be procured from LMSC under the Agena D contract. Changes, however, will be kept to an absolute minimum and will be provided in the basic vehicle only when several users will benefit.

e. Security

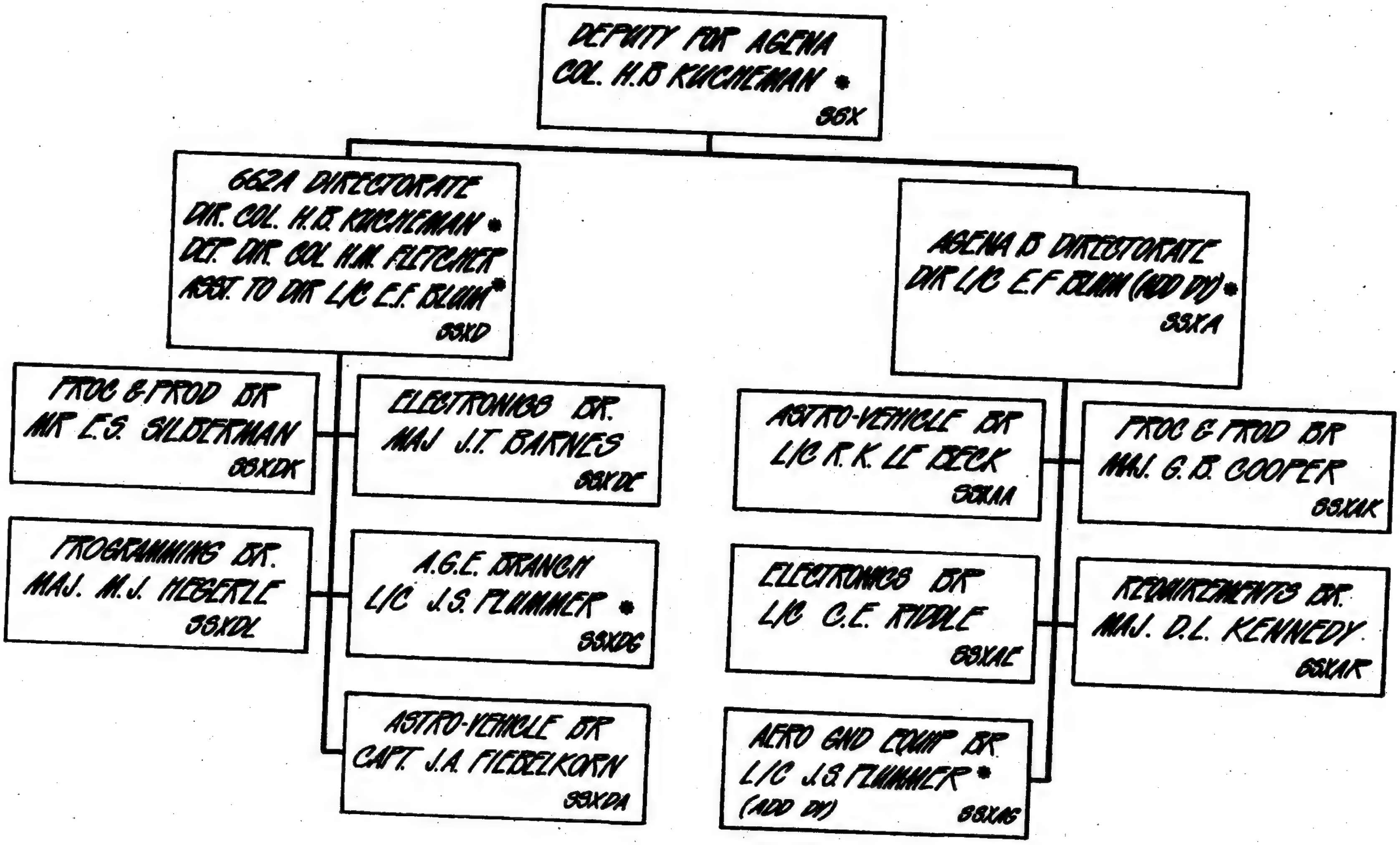
(1) An attempt has been made to reduce the level of security classification of the Agena D as much as possible consistent with the desire to avoid unnecessary publication of data relative the Agena D on an unrestrained basis. A copy of the detailed classification guide is Attachment 6.

(2) Industrial Security cognizance of LMSC is assigned to Western Contract Management Region. The AFPR at LMSC will maintain close liaison on the scheduling of inspections and other requirements of LMSC's security agreement with the DOD.

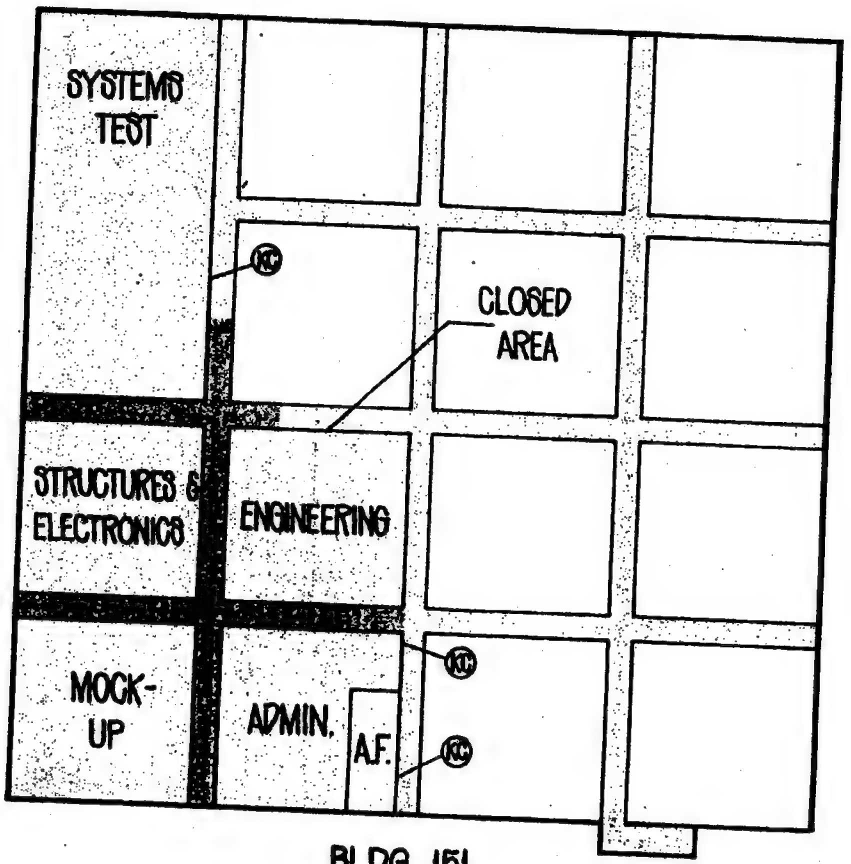
PROGRAM 662A MANAGEMENT CHANNELS


SECRETARY OF THE AIR FORCE SAFS
DR. CHARYK SAFUS
HQ. USAF GEN. HOLZAPPLE AFSDC
ACTION OFFICER 662A PROGRAM LT/COL. D. KEEFE AFSSV-EQ
AUTHORIZED DIRECT COMMUNICATIONS FOR HQ. USAF ACTIONS
HQ AFSC GEN. SCHRIEVER SCG
ACTION OFFICER 662A PROGRAM MAJ. REGAN SCGN
HQ SSD GEN. RITLAND SSG
DIRECTOR 662A PROGRAM COL. H.B. KUCHEMAN SSXD
AFPR LMSC COL. VOYLES
ENGINEERING LT/COL. E. BLUM
PROGRAMMING PROCUREMENT PRODUCTION COL. H. FLETCHER
ACO PRODUCTION INSPECTION

SSD ORGANIZATION



PROGRAM 662A PLANT LAYOUT



BLDG 151

(KC) KEY CARD ENTRANCE

OFFICE OF THE AIR FORCE PLANT REPRESENTATIVE
UNITED STATES AIR FORCE
LOCKHEED MISSILES AND SPACE COMPANY
SUNNYVALE, CALIFORNIA

REPLY TO ATTN OF: RWRM

28 Nov 61

SUBJECT: Memo of Understanding

TO: Colonel Henry B. Kucheman
Agena D System Program Director

1. This office recognizes the need for absolute access control to be used for the Agena D program. At the same time, it is advantageous that the resources of the AFPRO be used fully to assure satisfactory completion of the intended work. Toward this end, selected individuals from the AFPRO are designated contact personnel for their responsible functional areas and will have access, as the occasion requires, to perform the tasks assigned. Also, there will be requirements to cover a three-shift operation especially in the area of quality control. There are obvious times when these contact personnel may not be available to perform a specific task; this may require the designation of "backup" personnel. Such individuals will be designated by the AFPR or his Deputy as the occasion arises.

2. For all intents and purposes, Mr. Kerrwin Hagerty is designated the AFPRO team leader. He will maintain an office in the Air Force Program Management office, Building 151, and be the immediate point of contact for all AFPRO personnel. In addition, a secretary, Mrs. Rosaline Genovia, has been assigned for duty at the Agena D Air Force office supported by other contact personnel. This office may be considered an extension of the AFPR office located in Building 104 performing complete contractor surveillance as required by Air Force Procurement Instruction. Although not all inclusive, a list is attached which indicates the functional areas, the tasks to be performed and contact personnel designated.

3. In addition, it is anticipated that the AFPR and his Deputy may have occasion to be present at the Agena D complex but no special provisions are required. There is a need, however, that a specific area be designated for access to engineering data and program status. This must be given early consideration to meet the requirements not only of the military program directors but the LMSC program managers (Discoverer, Midas, etc) as well.

James H. Voyles Jr.
JAMES H. VOYLES, JR.
Colonel, USAF
AF Plant Representative

FUNCTIONAL AREA - CONTRACT ADMINISTRATION
AFPRO Contact Personnel - Mr. Kerrwin Hagerty

TASK TO BE PERFORMED	BY SPO	BY AFPRO
Vouchers		OPI
Spare Parts	Coordination	OPI
Approve Subs & P.O.s to Vendors	As Required	OPI
Price Analysis	Participant for Fact Finding PCO	OPI
Bailed Property	Coordination	OPI - property
CCNs (Negotiate)	Issue Only	OPI
Overtime	OPI Limits/Ceilings	Approve
Maintain & Protect Government Property		OPI
Contract Funding	OPI	Coordination
1097s	Action	OPI Review/ Recommendation
GAO, OSI, & FBI	Information	OPI
Tax Exempt Certificate		OPI

FUNCTIONAL AREA - PLANS AND MANAGEMENT
AFPRO Contact Personnel - Mr. Russell Dick

TASK TO BE PERFORMED	BY SPO	BY AFPRO
Secretary		X
Transportation		X
Office Supplies	Contractor will Supply	
Security (a) Internal	X	
(b) Industrial		X
(c) Visitors	X	
(d) Documents (Release of Info)		X
(e) Need to Know (Personal Contact)	Coordination	
(f) Safe Custodian		OPI Secretary
Mail Services		As Required
Reservations, etc.	X	
Badging Requests		X
Personnel Clearances		X
Time & Attendance Record (Secretary)		X
Reference Library		X
Communications (AF Accounting, telephone, TWX)		X

FUNCTIONAL AREA - MATERIEL MANAGEMENT

AFPRO Contact Personnel - Mr. William Bense

TASK TO BE PERFORMED	BY SPO	BY AFPRO
Property Administration		OPI
GFP	Coordination	OPI Approval
Spares Support	Requirements	OPI
Maintenance (Repair)	Coordination	OPI
Transportation (All Modes)		OPI
Facility Expansion Modernization & Replacement	Approval	OPI Review/ Recommendation
Packaging and Preservation		OPI
Plant Clearance		OPI
Procedures and Standards	Information	OPI
Priorities and Allocations	Coordination	OPI
Conservation Cost Control - Scrap		OPI

FUNCTIONAL AREA - PRODUCTION
AFPRO Contact Personnel - Mr. G. H. Weaver

TASK TO BE PERFORMED	BY SPO	BY AFPRO
ATPMs	OPI Process/Approve	Coordination & Recommendation
FCRs	Information	OPI
Plant Layout & Equipment Utilization	Coordination	OPI
Manpower	OPI	Coordination (before the fact)
Overtime	OPI Allowable Limits	Approving Expenditure
Make or Buy Plan	Approval	Coordination
Make or Buy (Execution of Plan)	Information	OPI
Production Status	OPI	Recommendation
Technical Direction	OPI	Information
ECPs	OPI	Coordination/ Recommendation
Value Engineering	Requirements	OPI
Labor Relations	Information	OPI
Sub-contractors Vendors	Information	OPI
GPAE		OPI
CCNs	Issue	Support ACO
AFPRO Boards & Committees	Membership As Required	OPI

FUNCTIONAL AREA - QUALITY CONTROL

AFPRO Contact Personnel -- Mr. William O'Connell

TASK TO BE PERFORMED	BY SPO	BY AFPRO
Inspection	Information As Required	OPI
Acceptance (DD 250)	Coordination	OPI
Procedures and Standards	Information	OPI
Reports		As required
Investigations (Reverse Depending on Situation)	Coordination	OPI
Ground Safety		OPI
Materiel Review Board	(Support) Member-Coordination	(Prime) Member
Reliability	Requirements	OPI
Specifications	OPI	Coordination and Recommendation

HEADQUARTERS
SPACE SYSTEMS DIVISION (AFSC)
UNITED STATES AIR FORCE
Air Force Unit Post Office
Los Angeles 45, California

FOREWORD

1. Purpose: The purpose of this guide is to provide a common basis for evaluating the degree of protection which must be provided to documents, photographs, equipment, material, information, etc., concerning the AGENA Programs.

2. Use of the Guide: It must be clearly understood by all users of the guide that it is a guide in the true sense of the word and cannot be considered as an index to mechanical classification. Each document and/or material must be classified on its own merits consistent with the basic principles of classification as set forth in this guide and other current classification directives. The determination of the proper classification to be applied thereto cannot always be made simply on the basis of content or apparent characteristics. In marking classified documents, personnel should apply their knowledge of the over-all plan, project, or operation when the relationship to other documents and/or material may compel a higher classification due to the compilation of such information.

3. Authority: This guide has been published by Hq Space Systems Division by authority of AFR 205-49, dated 22 October 1958, as amended, to provide basic classification policy to its agencies and contractors, and to other government agencies involved in the AGENA Program.

FOR THE COMMANDER

Reuben Podonsky
REUBEN PODONSKY
Major, USAF
Chief, Security Branch

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1 December 1961

SECTION I

GENERAL INSTRUCTIONS

1. Maintenance of proper security on this program is of paramount importance. The provisions of this classification guide will be closely observed

2. System Breakdown. For common understanding of the language used herein, the following breakdown of a system has been used throughout:

a. System - All elements necessary to accomplish the AGENA Program which is directed toward placing spacecraft in orbit or on specific trajectories; i.e., coordinated research and development, vehicles, boosters, test and training programs, launch complexes, support bases, launch and support organizations, etc.

b. BASIC AGENA - A complete operational unit consisting of the propulsion, guidance, airframe, ground-air communications, and aerospace ground equipment subsystems.

c. Subsystem - e.g., propulsion subsystem.

d. Component - e.g., computer as a component of the guidance subsystem.

e. Assembly - Major unit of a component.

f. Subassembly - Unit of an assembly.

3. Classification Recommendations. If the classifications contained herein impose impractical controls, or if progress in any phase of program development indicates that classification changes are appropriate and advisable, completely documented recommendations should be submitted to Hq SSD (SSAS). Assistance in maintaining current, effective, and realistic classification guidance is solicited of all participating military and industrial organizations.

4. Administrative Procedure for Effecting Classification Revision. Revisions to this guide will be effected by the issuance of letter, Subject: Revision No._____ to Master Security Classification Guide, BASIC AGENA. These letters will indicate the appropriate change and will constitute the authority for such revision. Upon receipt of these letters, the appropriate change should be made in the guide and the letter of authority inserted as the last page of the guide. When considered appropriate, a completely revised master guide will be issued by Hq SSD.

SECTION I (CONT'D)

GENERAL INSTRUCTIONS

5. Attention is invited to the Marking "FOR OFFICIAL USE ONLY (AFR 11-30)." This marking is not a security classification; however, it denotes Air Force information of a sensitive nature. According to Air Force policy, information bearing this marking is disseminated only to persons who are directly and officially concerned with the information and have a legitimate need for access. Within the Air Force, this information may be maintained in standard filing cabinets with other UNCLASSIFIED information. During business hours, it is under supervision of authorized personnel. After business hours, storage in a locked room or a guarded building is considered adequate protection. While these requirements are not binding upon Air Force contractors, it is requested that this guide be afforded protection comparable to that outlined above.

6. Weapon or Space Programs. Classification of applicable weapon or space program classified information or material (ATLAS, THOR, MIDAS, DISCOVERER, etc.) used in conjunction with the AGENA Program will be in accordance with the Security Classification Guide for the program concerned.

7. Downgrading and/or Declassification Authority. Classification changes appearing in any of the items within this Master Security Classification Guide constitute authority for regrading. This guide will be cited as authority for regrading of documents, photographs, equipment, material, information, etc., when effecting the classification change.

8. Automatic, Time-Phased Downgrading and Declassification System (AFR 205-2) and Industrial Security Manual (ISM): To assist users of this classification guide in determining the correct grouping of classified information as described in AFR 205-2 and the ISM see "AFR 205-2 Group Code" adjacent to Classification. (1 means Group 1, etc.)

SECTION II

RELEASE OF INFORMATION

1. Public Release of Unclassified Information.

a. All media information including, but not limited to, releases, articles, speeches, pictures, brochures, advertisements, presentations, displays, etc., on every phase of the AGENA Program must be approved by the Office of Information (DCE), Hq Space Systems Division (SSD). Contractors are responsible for carefully screening all information submitted to insure that it is unclassified. Final decisions on questions of security classification only with regard to the AGENA Program will be the responsibility of Hq SSD. Requests for public release of unclassified information will be submitted to SSD for approval as noted above. To prevent the unintentional and unauthorized release of sensitive information, in forwarding proposed releases a tentative classification at a minimum of CONFIDENTIAL should be assigned pending receipt of release approval. The contractor or agency submitting the proposed release should notify Hq SSD in their letter of transmittal of such tentative classification. Requests for downgrading of classified information may be submitted in accordance with Paragraph 4, Section I, this master guide. Any information submitted for approval of release to the public in accordance with Paragraph 5m, Industrial Security Manual for Safeguarding Classified Information (Attachment to DD Form 441 - Contractors Security Agreement with the DOD) will be submitted through Hq SSD (DCE). Prior coordination will be effected with the Office of Information, Hq SSD, for contemplated visits by media representatives to contractor facilities when the subject of media interest involves the AGENA Program.

b. Air Force AGENA Program prime contractors are responsible for each of their subcontractors complying with these requirements. Any material proposed for release by subcontractors will be routed through their prime contractor.

2. Requests for Determination of Proper Security Classification. All information submitted for a determination of proper security classification, other than information submitted for public release in accordance with Paragraph 1, this section, will be directed to Hq SSD (SSAS).

3. Requests for Authorization to Release Classified Information at Classified Symposiums, Seminars, etc. Requests of this type will be submitted to Hq SSD (SSAS) for approval a minimum of 30 days prior to the proposed date of release.

SECTION II (CONT'D)

RELEASE OF INFORMATION

4. Requests for Release of Information to Foreign Governments. Contractors receiving requests for release of classified information to foreign governments from any agency will forward these requests to Hq DCAS (TDC).

5. Requests for Release of Unclassified Technical Information by Foreign Governments or Individuals Residing in Foreign Countries. Contractors are requested to forward all such requests with a copy of the information requested to Hq SSD (TDC). (Attention is invited to Department of State "International Traffic In Arms" Regulations.)

NOTE: Identification of office symbols used herein is as follows:

1. DCE - Office of Information
2. TDC - Technical Data Center
3. SSAS - Security Branch
4. SSZA - AGENA Program Office
5. SSD - Space Systems Division
6. DCAS - Deputy Commander for Aerospace Systems

SECTION III

ADMINISTRATIVE AND REPORTING

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Complete list of contractors.	U	
2. The relationship and association of contractors to one another and Hq SSD.	U	
3. The following terms used alone or in combination with the name of any contractor or Hq Space Systems Division: DISCOVERER, AGENA, THOR, SATELLITE, ATLAS, NASA AGENA B Program, Recovery.	U	
4. Encrypt For Transmission Only (EFTO) procedures are to be used to the maximum extent consistent with sound communications practices and when necessary to preclude indiscriminate dissemination of program information.		
5. National priorities assigned to the AGENA Program.	U	
6. Contract numbers.	U	
7. Company project numbers.	U	
8. Contractor model designations, unless information under Items 1 and 2, Section IV, is revealed. In this case model designation will be CONFIDENTIAL.	U	
9. Details of contractual documents, status or progress of work performed on a single contract, file, and/or technical reports will be classified according to content as determined from this guide.		
10. Complete development planning and/or programming.	C	4
11. Status and/or progress of the complete AGENA Program.	C	4

SECTION IV

PRODUCTION, PROCUREMENT, AND FUNDING

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Number of AGENAS which are to be or have been produced and rates of delivery.	C	4
2. Number of items which are to be or have been produced and rates of delivery which cannot be correlated with AGENA schedule.	U	
3. Complete funding for the entire AGENA Program (all fund series) for the current and/or one additional fiscal year.	C	
4. Complete funding for entire AGENA Program (all fund series) for the current and/or two additional fiscal years.	C	4
5. Complete past funding for any one R&D or production contract.	U	
6. Total unit cost of any AGENA.	U	
7. Manufacturing, processing, technical or operating techniques which represent a significant advance in the state of the art and which are not of common knowledge, or the fact that some well-known technique which previously had been considered impractical has been developed to the point that significant practical application is feasible shall be assigned a temporary classification of SECRET pending determination of security classification by Hq SSD. (The contractor or agency that assigns the temporary security classification will promptly advise Hq SSD.)		
8. Data on purchase orders, shop orders, receiving reports, bills of lading, shipping orders, and packing instructions provided that production scheduling, number of AGENAS or subsystems to be produced or on hand, or other classified information is not revealed.	U	

SECTION IV (CONT'D)

PRODUCTION, PROCUREMENT, AND FUNDING

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
9. Data on parts, accessories, and equipment which are available on the open market, or produced for commercial use provided that ultimate classified use, or other classified information, is not revealed.	U	
10. Provisioning parts breakdown provided that classified information is not revealed.	U	

SECTION V

AGENA VEHICLES - LESS PAYLOAD

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Detailed or basic specifications.	C *	4
2. Subsidiary specifications will be classified according to content as determined from this master guide.		
3. A complete, or substantially complete, set of drawings.	C	4
4. Complete design of vehicles.	C	4
5. Complete design of subsystems.	C *	4
6. Detailed arrangement of components, assemblies, subassemblies or arrangement of subsystems within the vehicle.	C *	4
7. General arrangement of subsystems or components within the vehicle.	U	
8. Specific contour data (aerodynamic data other than military performance).	C	4
9. Major construction details (design and location of strength members, frames, ribs, formers, etc.).	C	4
10. Stress analysis data.	C	4
11. Individual detailed manufacturing shop and assembly drawings.	C *	4
12. Data on gauges or tooling (excluding specific contour data).	U	
13. Data on minor hardware items which clearly do not reveal classified information.	U	

SECTION V (CONT'D)

AGENA VEHICLES - LESS PAYLOAD

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
14. External configuration only provided physical or detailed access to classified information can be effectively denied to unauthorized personnel.	U	
15. Data pertaining to tests, test results and/or reports (other than flight tests) relative to vehicles and subsystems will be classified as determined from this guide and normally at CONFIDENTIAL.	C *	4
16. When the payload is attached to, or included within, the AGENA Vehicle the classification requirements of the payload will govern.		
17. Data on ground handling and support equipment, training equipment or programs, instrumentation (internal and external), maintenance, repair, and overhaul (as contained in handbooks, etc.) will be classified according to the nature of equipment and/or content as determined from this guide.		

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* Will not be classified if the following type of information can effectively be denied to unauthorized personnel: Information on requirements, performance, capability, life expectancy of hardware, and "state of the art" components.

SECTION VI

AIRFRAME SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Detailed or basic specifications.	C *	4
2. A complete, or substantially complete, set of drawings.	C	4
3. Complete design of subsystem.	C	4
4. Complete design details of components, assemblies, and subassemblies.	C *	4
5. Detailed arrangement of components, assemblies, and subassemblies.	C *	4
6. Individual detailed manufacturing shop and assembly drawings.	C *	4
7. Data on gauges and tooling.	U	
8. Data on minor hardware items which clearly do not reveal classified information.	U	
9. External configuration only.	U	
10. External configuration only of components, assemblies, or subassemblies (or portions thereof), provided physical or detailed access to classified information can be effectively denied to unauthorized personnel.	U	
11. Data on ground handling and support equipment, training equipment or programs, instrumentation (internal and external), maintenance, repair, and overhaul (as contained in handbooks, etc.) will be classified according to the nature of equipment and/or content as determined from this guide.		
12. Data pertaining to tests, test results and/or reports relative to subsystem.	C *	4

SECTION VI (CONT'D)

AIRFRAME SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
13. Data pertaining to tests, test results and/or reports relative to components, assemblies, and subassemblies not specifically covered above.	C *	4
14. Number of complete subsystems which are to be or have been produced and rates of delivery.	C	4
15. Delivery schedules, planned or actual, of components, assemblies, and subassemlies will be classified in accordance with Items 1 and 2, Section IV.		
16. Major construction details (design and location of ribs, strength members, frames, formers, etc.).	C	4

……

* Will not be classified if the following type of information can effectively be denied to unauthorized personnel: Information on requirements, performance, capability, life expectancy of hardware, and "state of the art" components

SECTION VII

PROPULSION SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Detailed or basic specifications.	C *	4
2. A complete, or substantially complete, set of drawings.	C	4
3. Complete design of subsystem.	C	4
4. Complete design details of engine only, components, assemblies, and subassemblies.	C *	4
5. Detailed arrangement of components, assemblies, and subassemblies.	C *	4
6. Significant operating principles.	C *	4
7. Complete specific performance of primary and secondary propulsion.	C	4
8. General performance. (Thrust class, restart capability, nominal burning time.)	U	
9. Individual detailed manufacturing shop and assembly drawings.	C *	4
10. Data on gauges and tooling.	U	
11. Data on minor hardware items which clearly do not reveal classified information.	U	
12. External configuration only of subsystem, provided physical or detailed access to classified information can be effectively denied to unauthorized personnel.	U	
13. External configuration only of components, assemblies, or subassemblies (or portions thereof), provided physical or detailed access to classified information can be effectively denied to unauthorized personnel.	U	

SECTION VII (CONT'D)

PROPULSION SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
14. Data on ground handling and support equipment, training equipment or programs, instrumentation (internal and external), maintenance, repair, and overhaul (as contained in handbooks, etc) will be classified according to the nature of equipment and/or content as determined from this guide.		
15. Data pertaining to tests, test results and/or reports relative to subsystem.	C	4
16. Number of complete subsystems which are to be or have been produced and rates of delivery.	C *	4
17. Data pertaining to tests, test results and/or reports relative to components, assemblies and subassemblies not specifically covered above.	C *	4
18. Delivery schedules, planned or actual, of components, assemblies, and subassemblies will be classified in accordance with Items 1 and 2, Section V.		

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* Will not be classified if the following type of information can effectively be denied to unauthorized personnel: Information on requirements, performance, capability, life expectancy of hardware, and "state of the art" components.

SECTION VIII

AUXILIARY POWER UNIT SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Detailed or basic specifications.	C *	4
2. A complete or substantially complete, set of drawings.	C	4
3. Complete design of subsystem.	C	4
4. Complete design details of components, assemblies, and subassemblies.	C *	4
5. Significant operating principles of subsystem.	C *	4
6. Significant operating principles of components, assemblies, and subassemblies.	C *	4
7. Complete specific performance of subsystem.	C	4
8. Specific performance of components, assemblies, and subassemblies which indicate system capability or operational limitations of APU.	C	4
9. Detailed arrangement of components, assemblies, and subassemblies.	C *	4
10. Individual detailed manufacturing shop and assembly drawings.	C *	4
11. Data on gauges and tooling.	U	
12. Data on minor hardware items which clearly do not reveal classified information.	U	
13. External configuration only of subsystem, components. assemblies, or subassemblies provided physical or detailed access to classified information can be effectively denied to unauthorized personnel.	U	

SECTION VIII (CONT'D)

AUXILIARY POWER UNIT SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
14. Data on ground handling and support equipment, training equipment or programs, instrumentation (internal and external), maintenance, repair, and overhaul (as contained in handbooks, etc.) will be classified according to the nature of equipment and/or content as determined from this guide.		
15. Data pertaining to tests, test results and/or reports relative to subsystem and its components, assemblies, and subassemblies not specifically covered above will be classified as determined from this guide and normally at a minimum of CONFIDENTIAL.	C *	4
16. Number of complete APU's which are to be or have been produced.	C	4
17. Delivery schedules, planned or actual, of components, assemblies, and subassemblies will be classified in accordance with Items 1 and 2, Section IV.		

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* Will not be classified if the following type of information can effectively be denied to unauthorized personnel: Information on requirements, performance, capability, life expectancy of hardware, and "state of the art" components.

SECTION IX

GUIDANCE AND CONTROL SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Detailed or basic specifications.	C *	4
2. A complete, or substantially complete, set of drawings.	C	4
3. Complete design of subsystem.	C	4
4. Complete design details of components, assemblies, and subassemblies.	C *	4
5. Significant operating principles of subsystem.	C *	4
6. Significant operating principles of components, assemblies, and subassemblies.	C *	4
7. Complete specific performance of subsystem.	C	4
8. General performance of subsystem.	C *	4
9. Specific performance of components, assemblies, and subassemblies which indicate system capability or operational limitations.	S	3
10. Detailed arrangement of components, assemblies, and subassemblies.	C *	4
11. Individual detailed manufacturing shop and assembly drawings.	C *	4
12. Data on gauges and tooling.	U	
13. Data on minor hardware items which clearly do not reveal classified information.	U	
14. External configuration only of subsystem, provided physical or detailed access to classified information can be effectively denied to unauthorized personnel.	U	
15. External configuration only of components, assemblies, or subassemblies (or portions thereof), provided physical or detailed access to classified information can be effectively denied to unauthorized personnel.	U	

SECTION IX (CONT'D)

GUIDANCE AND CONTROL SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
16. Data on ground handling and support equipment, training equipment or programs, instrumentation (internal and external), maintenance, repair, and overhaul (as contained in handbooks, etc.) will be classified according to the nature of equipment and/or content as determined from this guide.		
17. Data pertaining to tests, test results and/or reports relative to subsystem.	C-S	4
18. Data pertaining to tests, test results and/or reports relative to components, assemblies or subassemblies not specifically covered above.	C *	4
19. Frequency Bands to be used (X-Band, K-Band, etc.).	U	
20. Actual operating frequencies, including sidebands and post launch command techniques.	S	4
21. Limited frequency ranges for test purposes.	C	4
22. Number of subsystems which are to be or have been produced.	C	4
23. Delivery schedules, planned or actual, of components, assemblies, or subassemblies will be classified in accordance with Items 1 and 2, Section IV.		
24. Countermeasures, proven or unproven.	S	3

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* Will not be classified if the following type of information can effectively be denied to unauthorized personnel: Information on requirements, performance, capability, life expectancy of hardware, and "state of the art" components.

SECTION X

GROUND-AIR COMMUNICATIONS SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Detailed or basic specifications.	S *	4
2. A complete, or substantially complete, set of drawings.	S *	4
3. Complete design of subsystem.	S	4
4. Complete design details of components, assemblies, and subassemblies.	C **	4
5. Significant operating principles of subsystem.	S *	4
6. Significant operating principles of components, assemblies, and subassemblies.	C **	4
7. Subsystem performance data.	S	4
8. Specific performance of critical components, assemblies, and subassemblies which indicate system capability or operational limitations.	S	3
9. Detailed arrangement of components, assemblies, and subassemblies within the vehicle.	S *	4
10. Frequency bands (S-Band, K-Band, etc).	U	
11. Actual operational frequencies, including sidebands and details of post-launch command techniques.	S	4
12. Individual detailed manufacturing shop and assembly drawings.	C **	4
13. Data on gauges and tooling.	U	
14. Data on minor hardware items which clearly do not reveal classified information.	U	
15. External configuration only of subsystem, provided physical or detailed access to classified information can be effectively denied to unauthorized personnel.	U	

SECTION X (CONT'D)

GROUND-AIR COMMUNICATIONS SUBSYSTEM

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
16. External configuration only of components, assemblies, or subassemblies (or portions thereof).	U	
17. Number of vehicle-installed units which are to be or have been produced, planned or actual.	C	4
18. Delivery schedules, planned or actual, of components, assemblies, and subassemblies will be classified in accordance with Items 1 and 2, Section IV.		
19. Data on ground handling and support equipment, training equipment or programs, instrumentation (internal and external), maintenance, repair, and overhaul (as contained in handbooks, etc) will be classified according to the nature of equipment and/or content as determined from this guide.		
20. Data pertaining to tests, test results and/or reports relative to subsystem and its components, assemblies, and subassemblies not specifically covered above will be classified as determined from this guide and normally at a minimum of CONFIDENTIAL.	C-S	4

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* When such documents reveal capability, over-all operating characteristics, or functional limitations of the system, a SECRET classification is required. Tests and standard equipment will ordinarily be UNCLASSIFIED.

** When significant design information, operating principles, performance information, or other information warranting a CONFIDENTIAL classification is revealed.

SECTION XI

FLIGHT AND CAPTIVE TESTING

INFORMATION REVEALING	CLASSIFICATION	AFR 205-2 GROUP CODE
1. Subsystem results and conclusions will be classified in accordance with the corresponding section of this guide.		
2. Complete AGENA results and conclusions will be classified in accordance with the highest pertinent classification as determined from this guide.		
3. AGENA payload results and conclusions will be classified in accordance with the current security classification guide of the program involved.		
4. Complete flight schedules.	S	4
5. Dates of individual tests prior to DOD release.	C	4
6. Detailed test objectives.	C *	4
7. Location of tests.	U	
8. Significant progress on, or completion of test schedules prior to DOD release.	S	4

……

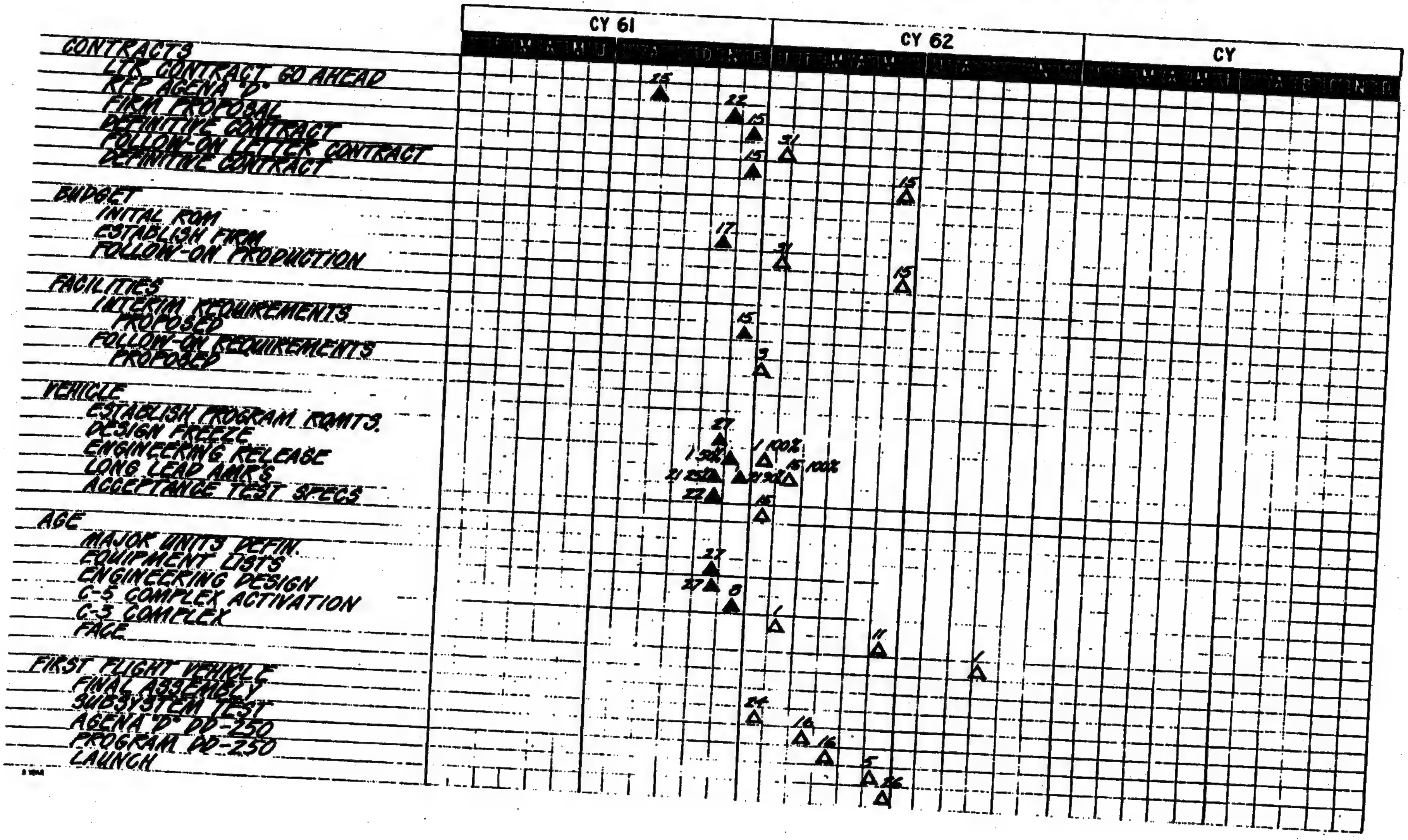
* Information of this type, as applied to a particular flight, will be UNCLASSIFIED after public release by DOD.

PART III - MASTER SCHEDULES

3.0 SUMMARY

This section presents the development, production and launch schedules for the Program 662A support to Discoverer and other Space Systems Division space programs. The Agena D major development milestones are shown on Figure III-1. The Agena final assembly completion schedule is depicted on Figure III-2. The D-DD 250 Summary, the date that the Agena D is delivered to the using programs is shown in Figure III-3. and the composite launch schedule of all programs using the Agena D is shown in Figure III-4.

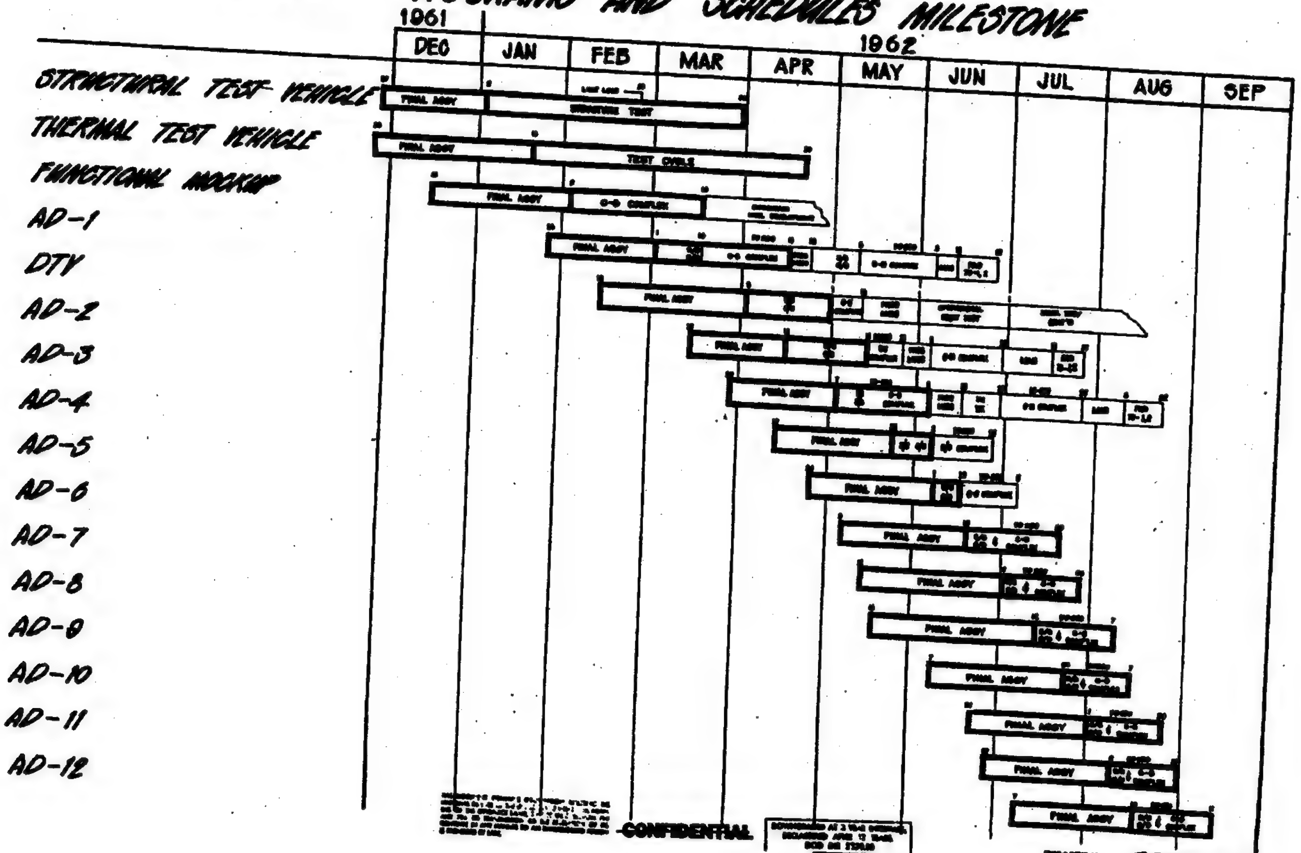
PROGRAM 66ZA MAJOR MILESTONES



~~CONFIDENTIAL~~

PROGRAM 662A

MASTER PROGRAMS AND SCHEDULES MILESTONE



[illegible]

CONFIDENTIAL

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

SSD-61-9

SECRET

AGENA D FINAL ASSEMBLY COMPLETION SUMMARY

1 — AGENA B
1 — AGENA D
○ — PLANNING VEH

	CY 62												CY 63												CY 64											
DISCOVERER	2	2	2	2	2	2	3	3	(1)																											
NASA		1	1			1	1	2	1	2		1		2	1		1	1	1																	
[redacted]								[redacted]																												
SNAPSHOT																																				
ADVENT				1																																
621-A																																				
VELA HOTEL														(1)			(1)			(1)			(1)	(1)												
206													(1)			(1)			(1)			(1)		(1)												
MIDAS	1			1		1				1	1		1	1	1	1	1	1	2	1																
[redacted]	[redacted]																																			
PROGRAM USAGE AGENA "B"	4	0	1	0	2	1	2	0	1	2		1		2	1		1	1	1																	
PROGRAM USAGE AGENA "D"			1	1	2	2	3	3	4	5	6	5	6	4	4	4	2	3	4	4		1	1	2												
TOTAL AGENA D MFG RATE/MO			1	1	2	2	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4												
CUM AGENA D UNASSIGNED										+1	-1	0	-2	-2	-2	-2	0	+1	+1	+1	[illegible]	[illegible]	[illegible]	[illegible]												

SECRET

AGENA D-DD 250 SUMMARY

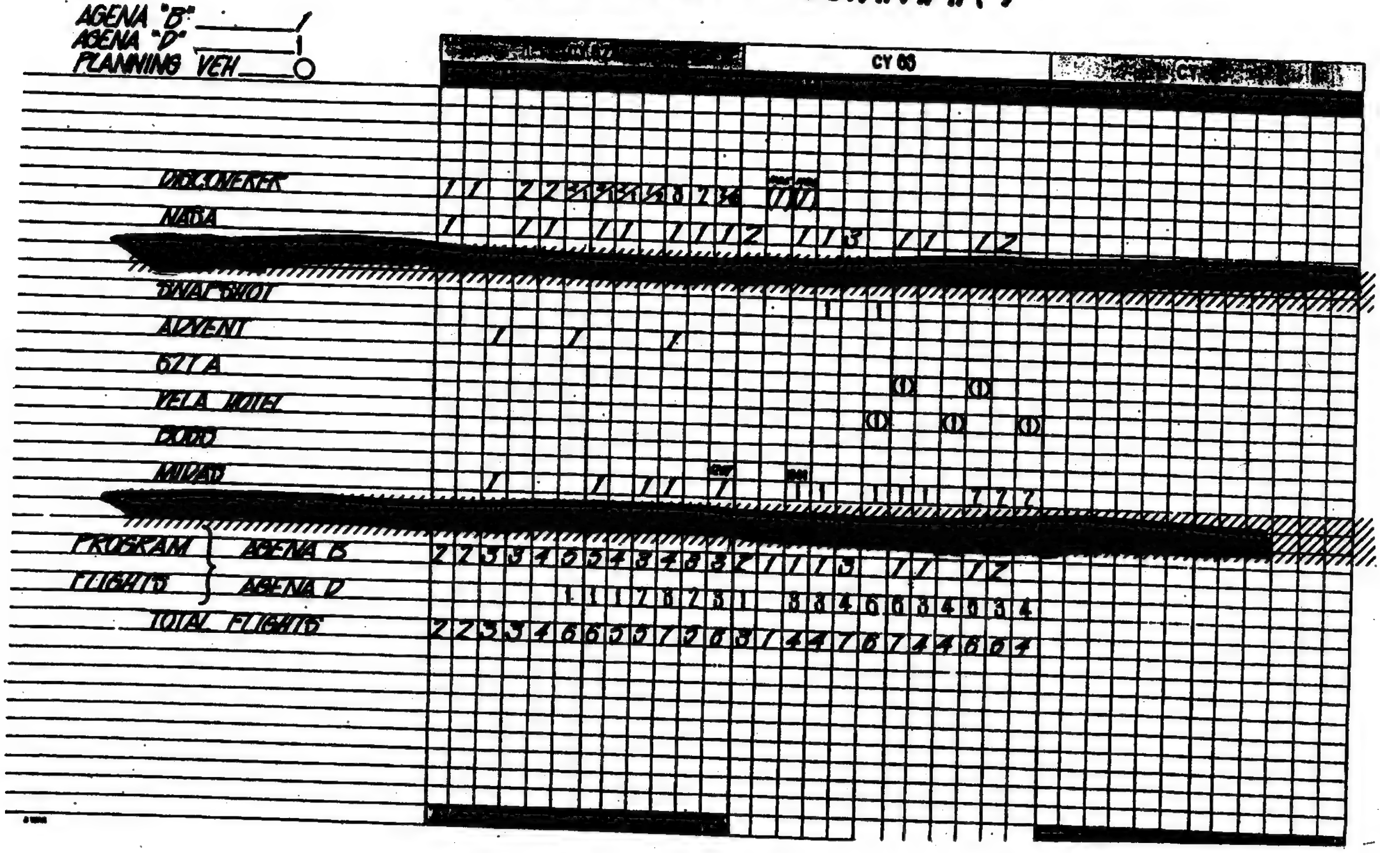
○ PLANNING VEHICLE

	CY 62												CY 63												CY 64											
DISCOVERER				1	1	2	3	4	%																											
NASA																																				
[redacted]	▨	▨	▨	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨
SNAPSHOT										1		1									1															
ADVENT																																				
621 A															①			①			①			①												
VELA HOTEL													①			①				①		①														
BOSS																																				
MIDAS										①	①			①	②		①	②	②	①																
[redacted]	▨	▨	▨	▨	▨	▨	▨	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨
TOTAL				1	1	2	3	4	3	3	3	3	4	4	3	4	3	3	4	3	3	1		1												

SECRET

SSGD-61-1

AGENA FLIGHT SUMMARY



PART IV - FACILITIES

4.0 GENERAL

The industrial facilities currently utilized in support of Agena D production are owned by USAF, USN, and Lockheed. The equipment is co-located primarily in Buildings 103 and 151, as shown in Figure IV-1 and has an approximate value as shown in Figure IV-2. One of the objectives of the accelerated Agena D program is to create a separate facility to produce the Agena D in order to accomplish the following:

a. Isolate the cost such as to allow procurement on a fixed price basis.

b. Provide shortened communication and command channels and quick reaction through shorter spans and reduction of paper work.

c. Provide efficient production layout and flow pattern.

d. Utilize the best of the "Kelly Johnson" approach.

4.1 APPROACH

To the end of providing a separate facility to produce the Agena D, LMSC will construct a new building (152) to house the manufacturing facilities which will be derived from equipment

LMSC TOTAL FACILITIES

● USAF	8.3
● NAVY	40.4
● LOCKHEED	78.1*

* INCLUDES 31.72 LEASED BLDGS

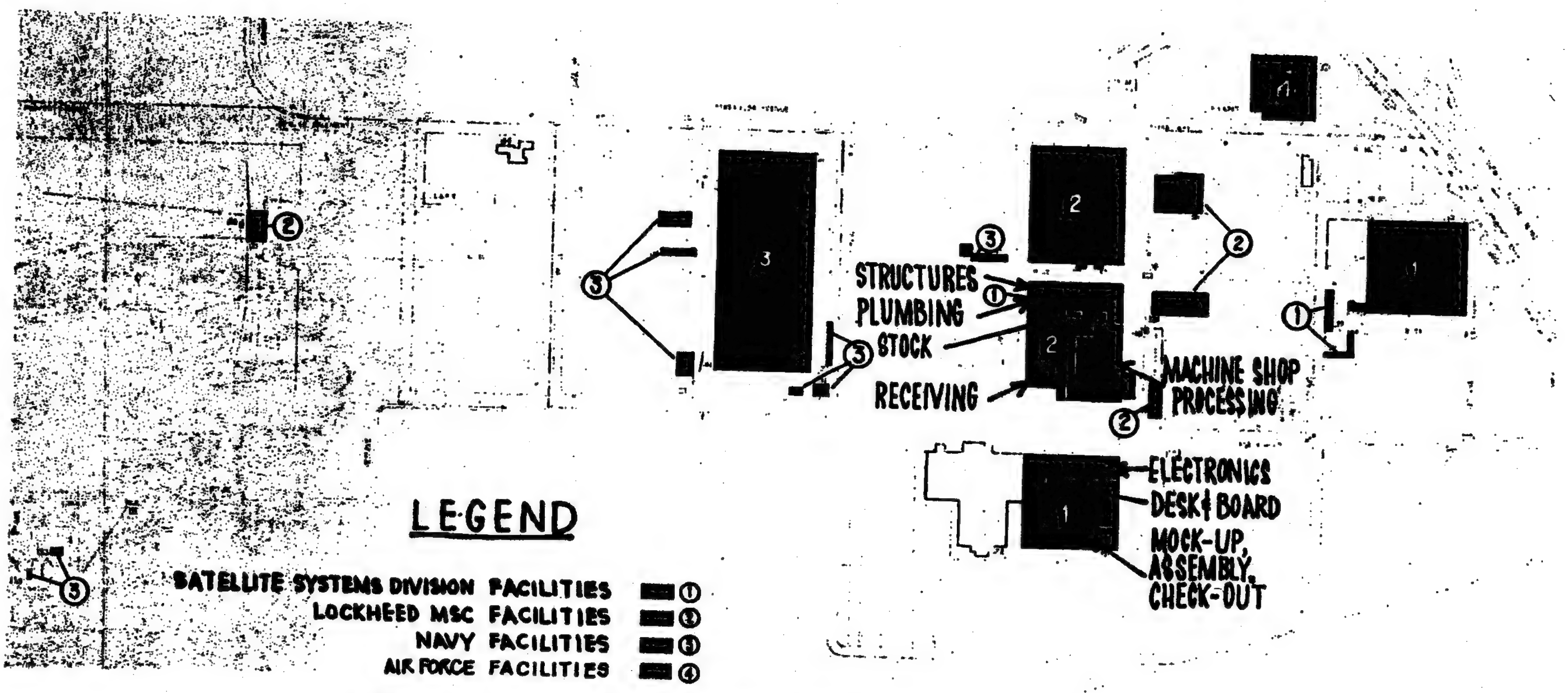
AGENA D OBJECTIVES

- CREATE A SEPARATE FACILITY FOR MANUFACTURING AGENA D
  - SKUNK-WORKS APPROACH
  - EFFICIENT PRODUCTION
  - ISOLATE COST

CONDITIONS & REQUIREMENTS

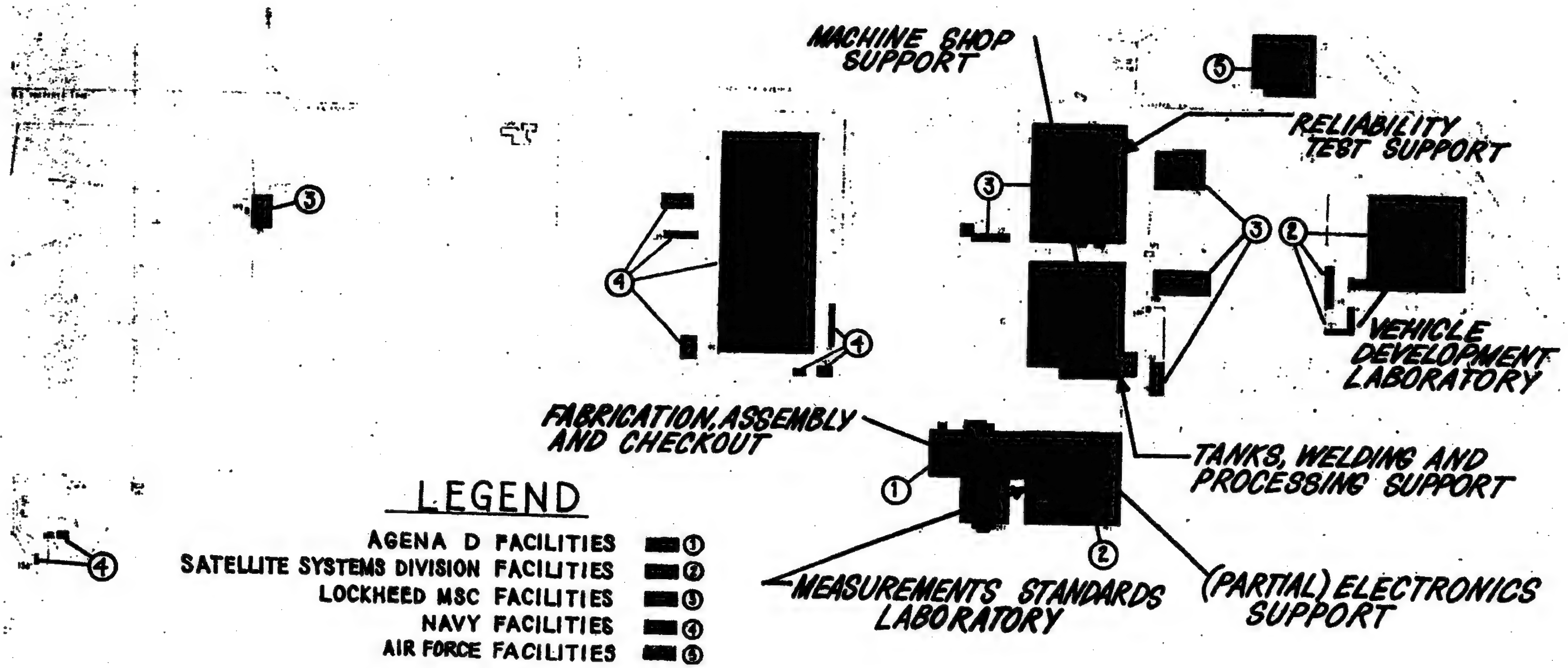
- ALL MANUFACTURING TO BE LOCATED IN BLDG. 152 EXCEPT "MONUMENTS"
    - A. HEAT TREAT
    - B. PROCESSING
    - C. WELDING
- QUALIFICATION & RELIABILITY TESTING FACILITIES TO BE AUGMENTED IN BLDG. 102
- RECEIVING, INSPECTION AND FUNCTIONAL TEST TO BE ESTABLISHED FOR AGENA D IN BUILDING 152
- PYROTECHNIC TESTING FACILITIES TO BE AUGMENTED AT SANTA CRUZ TEST BASE
- PROVIDE A VEHICLE DEVELOPMENT LABORATORY
- AUGMENT EXISTING MANUFACTURING ELECTRONICS IN BULDING 151 TO MEET FOLLOW-ON PRODUCTION RATE
- DOES NOT INCLUDE FLUSHING FACILITIES OR LAUNCH STAND MODS

SUNNYVALE FACILITIES



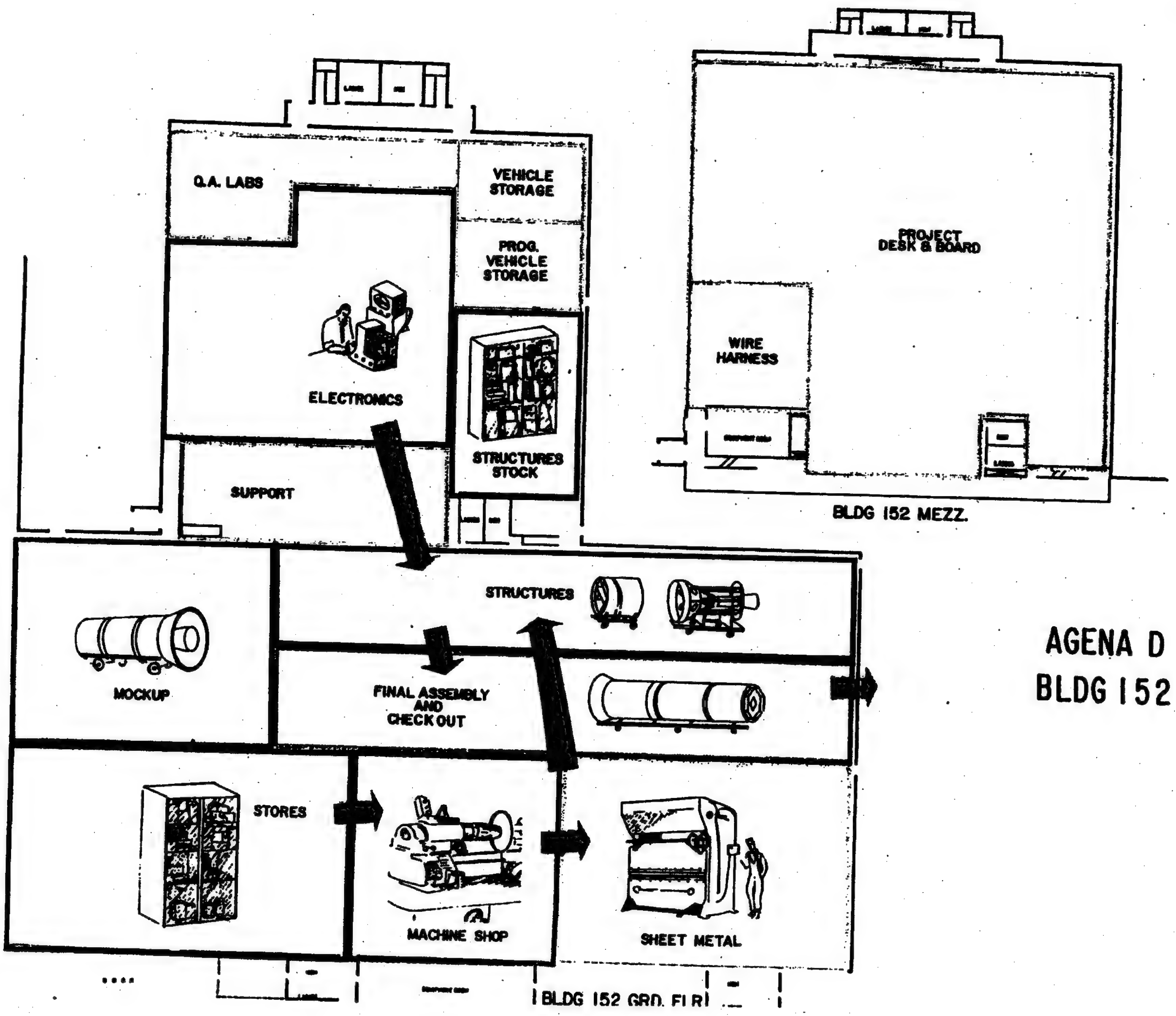
AREAS OF AGENA D ACTIVITY - JAN 1, 1962

SUNNYVALE ACTIVITIES


MACHINE SHOP SUPPORT
⑤
RELIABILITY TEST SUPPORT
③
③
②
④
④
VEHICLE DEVELOPMENT LABORATORY
FABRICATION, ASSEMBLY AND CHECKOUT
①
TANKS, WELDING AND PROCESSING SUPPORT
②
③
④
MEASUREMENTS STANDARDS LABORATORY
(PARTIAL) ELECTRONICS SUPPORT
LEGEND
AGENA D FACILITIES ①
SATELLITE SYSTEMS DIVISION FACILITIES ②
LOCKHEED MSC FACILITIES ③
NAVY FACILITIES ④
AIR FORCE FACILITIES ⑤

AREAS OF AGENA D ACTIVITY - JAN 1963

AGENA D
BLDG 152



AGENA D FACILITY REQUIREMENTS

5/MO

REQUIRING ORGANIZATION	TOTAL FOR FISCAL YEAR 62	TOTAL FOR FISCAL YEAR 63	PROGRAM TOTALS
MANUFACTURING	$ 1,775,000	$ 0	$ 1,775,000
SANTA CRUZ TEST BASE	13,300	13,800	27,100
VEHICLE DEVELOPMENT LABORATORY	1,356,800	0	1,356,800
QUALITY ASSURANCE	1,277,100	13,400	1,290,500
TOTALS	$ 4,422,200	$ 27,200	$ 4,449,400

AGENA D FACILITY REQUIREMENTS

4/MO

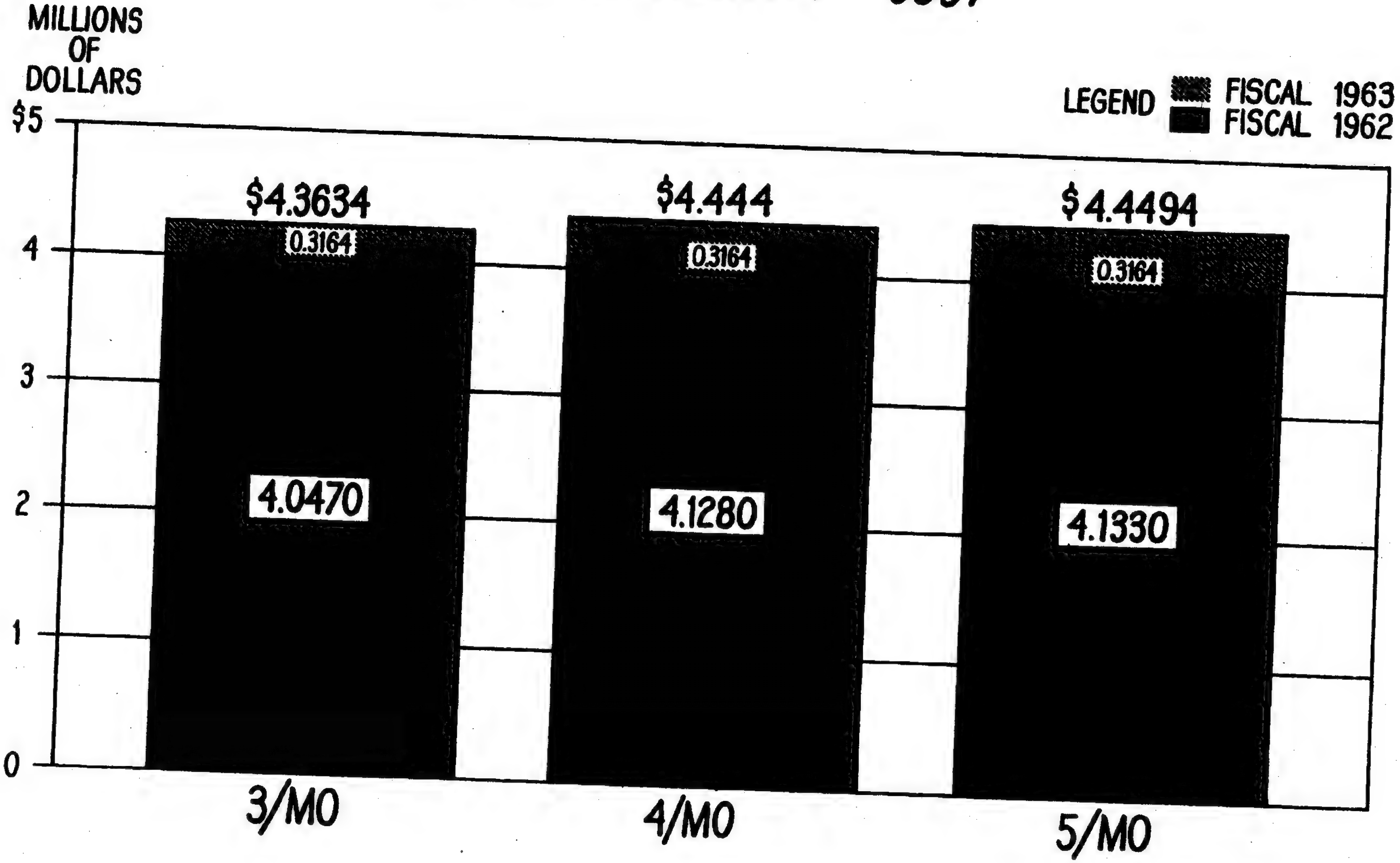
REQUIRING ORGANIZATION	TOTAL FOR FISCAL YEAR 62	TOTAL FOR FISCAL YEAR 63	PROGRAM TOTALS
MANUFACTURING	$1,770,000	$0	$1,770,000
SANTA CRUZ TEST BASE	13,300	13,800	27,100
VEHICLE DEVELOPMENT LABORATORY	1,356,800	0	1,356,800
QUALITY ASSURANCE	1,277,100	13,400	1,290,500
TOTALS	$4,417,200	$27,200	$4,444,400

AGENA D FACILITY REQUIREMENTS

3/MO

REQUIRING ORGANIZATION	TOTAL FOR FISCAL YEAR 62	TOTAL FOR FISCAL YEAR 63	PROGRAM TOTALS
MANUFACTURING	$1,696,500	$0	$1,696,500
SANTA CRUZ TEST BASE	13,300	13, 800	27, 100
VEHICLE DEVELOPMENT LABORATORY	1,356, 800	0	1,356, 800
QUALITY ASSURANCE	1,274,600	13, 400	1,288,000
TOTALS	4,336, 200	27, 200	4,363,400

AGENA D FACILITY COST



PART V - BUDGET & FISCAL

5.0 SUMMARY

This section presents the fiscal procedures, funding requirements and plan for replenishing the reimbursable account. The Agena D funding requirements for the basic (12 vehicle) contract plus a 5 vehicle per month follow-on program are shown on Figure V-1. The program budget requirements for FY-62 and FY-63 are derived from current SSD integrated launch schedule shown on Figure III-2. The contractor's initial (ROM) and formal cost proposal by major cost element are shown on Figure V-II.

5.1 FISCAL PROCEDURES

a. Requirements - All Agena D requirements will be reflected on the official Air Force Integrated Launch Schedules. Space System Program Directors will be requested to sign-off for their requirements prior to SSD approval of the official Integrated Launch Schedule. The production rate of the Agena D will be geared to support the approved integrated launch requirement. Any program schedule changes which will adjust the Agena D production rate will be coordinated with the 662A Program Office. Allocation of the scheduled production will not be made prior to preliminary DD 250 acceptance.

b. Budget - The 662A Program Office will prepare an annual financial plan and budget estimate to sustain an Agena D production rate to support program launch requirements. Upon approval of fiscal year funding requirements, the Comptroller (DCCB) will be responsible for obtaining necessary P-630 funds to provide orderly funding of the contract. These funds may be reimbursable funds or funds derived from approved programs.

c. Programming - The 662A Program Office will provide the using program offices with a standard unit cost for the Agena D. These standard unit costs will include all cost associated with fabrication and test of the Agena D plus the cost of spares and product improvement. These unit costs will be revised as actual cost information is obtained. The standard unit costs provided will be utilized by all using space programs in preparation of the yearly financial plan and budget estimates. Production, procurement and modification lead times will be provided the using programs by the 662A Program Office. The individual program costs of the Agena D will be programmed during the fiscal year in which delivery is scheduled. The program peculiar, and optional equipment plus installation, system checkout, and launch costs, will be funded separately by each program office. The costs associated with this effort will be programmed on an incremental basis. Any costs associated with slippage of established program schedules will be funded by the using program office. The initial unit cost estimate is 1.5M per Agena D at

DD 250 acceptance.

d. Procurement - Assuming that reimbursable funds are utilized throughout the Agena D program, the DD 250 will be the action document to transfer program funds to the reimbursable fund account. At the time of DD 250 acceptance, the most current cost information will be utilized to establish the program funding changes for the vehicle. The DD 250 will be forwarded to the Comptroller (DCCA). This procedure will be followed until a fixed price contract is negotiated for the Agena D, at which time the unit cost will become fixed.

FIGURE V-I

FUNDING REQUIREMENTS FOR THE AGENA D PROGRAM (CONTRACTOR ESTIMATES)

	FY-62	FY-63	TOTAL
Basic Contract (-21) **12 Flight Vehicles**	32.9	7.0	39.9
Follow-on Contract (-68) **45 Flight Vehicles** **Delivered in FY-63**	16.0	44.0	60.0
Long Lead for **Sustained 5/Mo Rate**	——	37.5	37.5
TOTALS	48.9	88.5	137.4

BUDGET ESTIMATE INITIAL PROGRAM

	(ROM)	(PROPOSAL)
● MANAGEMENT & CONTROLS	0.9	0.9
● ANALYSIS & DESIGN	4.4	5.1
● DEVELOPMENT TEST	3.3	3.2
● RELIABILITY	0.4	0.3
● AGE DESIGN	1.6	2.2
● LOGISTIC SUPPORT	0.6	0.3
● VEHICLE HARDWARE (12 + DTV)	17.1	16.2
● VEHICLE MOCKUPS	0.5	0.7
● MTE, AGE, & TOOLING	6.6	4.8
● TEST HARDWARE & SCTB SUPPORT	2.6	2.8
● SPARES	1.9	3.1
TOTAL	39.9	39.6

● CONTRACTOR COST PROPOSAL	15 DEC 1961 ✓
● CONTRACT DEFINITIZED	END JAN 1961
● ACTUAL COSTS DETERMINED	AT DELIVERY

PROGRAM PLANNING

- AGENA D PROGRAM OFFICE RESPONSIBILITIES
  - AGENA "D" UNIT COST
  - AGENA "D" DELIVERY SCHEDULE
  - AGENA "D" PROCUREMENT

- USING PROGRAM RESPONSIBILITIES
  - PROGRAM TOTAL UNIT COST IN FY OF DELIVERY
  - INCREMENTAL PROGRAMMING FOR OPTIONAL & PECULIAR
  - SEPARATE CONTRACTING

REIMBURSABLE FUND

FUNDS TRANSFER

TIME—DD—250 ACCEPTANCE

ACTION DOCUMENT—DD—250

COST———CURRENT COST AT DELIVERY

TRANSFER——BY DCCA

NNNMCZCBKA292ZCJQD284
PP RJWZBK
DE RJEZHQ 1118
ZNR
ⓟ222309Z
FM HQ USAF WASH DC
TO RJEZFF/AFSC ANDREWS AFB MD
INFO RJWZBK/SSD LOS ANGELES CALIF
BT

REC'D
23 NOV 1961 04 05

AFBMD
ACTION SSZK
1961 NOV 22 PM 8:40
INFO SSZ

UNCLAS FR AFSPM 80799
REF BRIEFING COL EVANS THIS HQ 17 NOV 61. SUBJECT AGENA B. FOLLOWING PROCUREMENT GUIDLINES WILL PERTAIN. THIS MSG IN SIX PARTS. MATTERS PERTAINING TO ORGANIZATION AND PROGRAM MANAGEMENT ARE SUBJECT OF SEPARATE COMMUNICATION. PART I. DELEGATION OF PROCUREMENT AUTHORITY. THE SPECIAL DELEGATION OF AUTHORITY REQUESTED DEFERENCED BRIEFING IS NOT CONSIDERED ESSENTIAL. AFSC PROCUREMENT REVIEW S CONSIDERED TO BE ADVISABLE. LITTLE DELAY SHOULD ACCRUE THROUGH PROCEDURE PROPOSED BY AFSC DIRECTOR OF PROCUREMENT WHERE ON THE SPOT PROCUREMENT COMMITTEE REVIEW WILL BE MADE WHEN

PAGE TWO RJEZHQ 1118
NECESSARY. PART II. CONTRACT GUIDELINES FOR INCENTIVE CONTRACT (A) TARGETS. TARGETS MUST BE REALISTIC AND MUST BE SET AT AN EARLY POINT IN PERFORMANCE. SUGGEST THAT AF AND CONTRACTOR PAST EXPERIENCE AND LATEST AVAIL DATA BE USED IN SETTING COST AND PERFORMANCE TARGETS. WHERE COST TARGET CANNOT BE SET ON A SPECIFIC DOLLAR THEN A FLAT SPOT OR PLATEAU DOLLAR RANGE MAY BE USED. TARGET FEE WILL APPLY IN FLAT SPOT WITH INCENTIVES APPLYING ABOVE AND BELOW. (B) PROFIT RANGE. RANGE OF PROFITS SHOULD EXTEND IN EQUAL RELATIONSHIP UPWARD AND DOWNWARD FROM THE TARGET FEE AND MAY EXTEND TO THE FULL STATUTORY LIMIT. THE LATEST FEE NEGOTIATED WITH THIS CONTRACTOR ON A MAJOR PROCUREMENT SHOULD BE USED IN NEGOTIATING A TARGET FEE. (C) QUALITY AND PERFORMANCE SPECIFIED MUST BE ESSENTIAL. EXTRAORDINARY QUALITY OR PERFORMANCE MAY EARN INCENTIVE COMPENSATION *ONDYITS REAMTVALUE TO THE AF. (D) MEASUREMENT. ASSURE ADEQUATE MEANS OF MEASUREMENT. MEASUREMENT ITEMS SHOULD BE THE FEWEST PRACTICAL NUMBER AND SHOULD BE KEY MEANINGFUL POINTS. WHERE NO TANGIBLE MEASUREMENT MEANS EXIST AND JUDGMENT TYPE EVALUATION MUST BE USED, JUDGMENT OF THE AIR FORCE WILL APPLY AND WILL DECIDE. (E) BALANCE OF INCENTIVE FORCES. INCENTIVE ITEMS PRESENTED IN 17 NOV BRIEF INCLUDED COST, DELIVERY AND

*ONLY IN Relation to its REAL VALUE to

56428

PAGE THREE RJEZHQ 1118
PERFORMANCE. ITEMS SHOULD BE WEIGHTED SO AS TO PROVIDE A BALANCE OF FORCES DESIGNED TO ENCOURAGE THE CONTRACTOR TO REMAIN ON A DESIRED EFFORT COURSE. REFERENCED BRIEFING ALLOCATED 500/0 TO COST AND ONLY 25 PER CENT TO DELIVERY AND PERFORMANCE. IN THIS CASE, CONSIDERING THE IMPORTANCE OF PERFORMANCE AND DELIVERY, IT IS SUGGESTED THAT AN APROXIMATELY EQUAL SPLIT OF ALL THREE FACTORS WOULD BE MORE NEARLY APPROPRIATE. RELIABILITY CONSIDERATIONS SHOULD BE INCLUDED AND IF AT ALL POSSIBLE FINAL OR LAUNCH RESULTS SHOULD BE INCLUDED. (F) OTHER CONTRACTS. THE CONTRACTOR MUST ASSURE THAT PERFORMANCE STANDARDS ON OTHER DEFENSE CONTRACTS WILL NOT BE DECREASED IN ORDER TO CONCENTRATE ON ACHIEVEMENT OF INCENTIVE PAYMENTS UNDER THIS CONTRACT. PART III. PROFIT LIMITATIONS. ASPR ADMINISTRATIVE LIMITS ON PROFIT ARE WAIVED FOR THIS PROCUREMENT. STATUTORY LIMITS WILL APPLY. PART IV. PERTINENT TERMS OF THE CONTRACT WILL BE REVIEWED BY THIS HQ PRIOR TO FINAL EXECUTION. IT IS SUGGESTED VTHAT AN APPROPRIATE PRESENTATION BE MADE. ADVISE US SUFFICIENTLY IN ADVANCE TO PERMI ARRANGEMENTS. PART V. THE ACCOUNTING SYSTEM MUST ASSURE PROPER SECREAGATION AND ALLOCATION OF COSTS TO THE PERTINENT CONTRACT. SUGGEST ACCOUNTING SYSTEM PROVIDE COST DATA WHICH WILL BE U FUL IN FOLLOW ON

PAGE FOUR RJEZHQ 1118
PROCUREMENTS. PART VI. FACILITIES CONSIDERATIONS: (A) DURING NEGOTIATIONS ASSURE THAT NO ITEMS PROPERLY CHARGEALE TO FACILITY CONTRACTS ARE INCLUDED IN THE TARGET PRICE OF THE INCENTIVE CONTRACT. (B) AFTER THE INCENTIVE CONTRACT IS ESTABLISHED CONSIDER FACILITY MATTERS SO THAT NO ITEMS ANTICIPATED UNDER THE INCENTIVE CONTRACT ARE CHARGED AGAINST THE FACILITY CONTRACT. (C) NEW FACILITY REQUIREMENTS AND COSTS MUST BE FIRMED UP SOON. LATER FACILITY REQUIREMITENTS WHICH CONTRIBUTE TO THIS PROGRAM, ALTHOUGH CHARGD UNDER THE FACILITY CONTRACT, SHULD BE CONSIDERED IN LIGHT OF THEIR EFFECT ON THE INCENTIVE CONTRACT AND APPROPRIATE ADJUSTMENTS MADE. (D) IN ESTIMATING COST TARGETS ANTICIPATE THE INCRASE EFFICIENCY AND EFFECTIVENESS TO BE PROVIDED BY FACILITIES NOW BEING REQUESTED.
BT
22/2326Z NOV RJEZHQ

Immediate action not required.
Capt.
Staff Duty Officer 2015/22Nov

T

~~SECRET~~

NRO 005 H24

RJWZBK
DE RJEZHQ 389
P 301909Z
FM HQ USAF WASH DC
TO RJEZFF/AFSC ANDREWS AFB MD
INFO RJWZBK/SSD LOS ANGELES CALIF
BT

RECD
DEC 1961 01 34

AFBMD
ACTION SSZA
1961 NOV 30 PM 5:59
INFO SSZ

~~SECRET~~ FROM AFSDC-F 82350

REF BRIEFING COL EVANS THIS HQS 17 NOV 61, SUBJECT AGENA D. THIS MESSAGE IN EIGHT PARTS. PART I. PROGRAM DIRECTION CONTAINED IN HQ USAF LTR TO AFSC SUBJECT STANDARDIZED AGENA D SPACE VEHICLE DTD 27 SEP 61 AND HQ USAF LTR TO AFSC, SAME SUBJECT, DTD 26 OCT 61 IS SUPERSEDED BY DIRECTION CONTAINED HEREIN. NO ACTION TO BE TAKEN RELATIVE PROCEDURES CONTAINED IN DDR&E 4 OCT 61 MEMO ATTACHED ABOVE REF 26 OCT 61 LTR. PART II. PROCUREMENT GUIDELINES WILL BE IN ACCORDANCE WITH HQ USAF (AFSPM) MESSAGE TO AFSC DTD 22 NOV 61.✓ PART III. FOLLOWING ARE PROGRAM GUIDELINES: (A) AGENA D TO BE PHASED INTO

Riesle Letter

PAGE TWO RJEZHQ 389

DISCOVERER ASAP. (B) AGENA B TO BE USED AS BACK-UP FOR INITIAL AGENA D FOR DISCOVERER TO PROTECT LAUNCH DATES. (C) AGENA D TO BE PHASED INTO ALL NEW PROGRAMS LAUNCHING AFTER 1 JAN 63. (D) AGENA D TO BE PHASED INTO PROJECTS 101B AND 201 ON NEXT VEHICLE ORDER. (E) AGENA D TO BE PHASED INTO PROJECT 102 AFTER INITIAL FOUR VEHICLES. (F) PHASING AGENA D INTO MIDAS TO BE EVALUATED AND RECOMMENDATIONS PRESENTED TO HQ USAF ASAP. (G) INITIAL AGENA DS WILL CARRY DX-RATING OF USING PROGRAM.✓ DECISION RE: DX RATING FOR FOLLOW-ON TO BE MADE IMMEDIATE FUTURE.✓ (H) SPECIAL LMSC ENGINEERING SYSTEM TO BE AS DISCUSSED IN VARIOUS MEETINGS.✓ PROGRAM DIRECTOR WILL ESTABLISH DRAWING, SPECIFICATION AND PROCUREMENT DATA REQUIREMENTS.✓ THIS TO BE NOT LESS THAN THAT REQUIRED FOR POSSIBLE FPI CONTRACT IN FUTURE. (I) AN EARLY AND FINAL CONFIGURATION FREEZE TO BE MADE.✓ CHANGES RESULTING FROM DEVELOPMENT OR USING PROGRAMS TO BE DETERMINED AND APPROVED BY AGENA D PROGRAM DIRECTOR AND USING MILITARY PROGRAM DIRECTORS. (J) LMSC ENGINEERS TO BE LOCATED IN SECURE AREAS IMMEDIATELY ADJACENT TO TOOLING AND MANUFACTURING AREA. (K)✓ RAPID DRAWING RELEASE SYSTEM FROM PROJECT ENGINEER'S APPROVAL TO MFG GROUP WILL BE ESTABLISHED. DRAWINGS TO BE SUITABLE FOR USE BY ALTERNATE CONTRACTORS IF REQUIRED.✓ (L)✓ AIR FORCE PROJECT PERSONNEL TO WORK CLOSE ENOUGH TO LMSC PROJECT

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ENGINEER TO PRECLUDE NEED FOR FORMAL MEETINGS. (M) REASONABLE OVERTIME MAY BE USED AS DETERMINED BY LMSC AND APPROVED BY AGENA D PROGRAM DIRECTOR.✓ (N) INTERCHANGEABILITY OF FIRST FOUR VEHICLES MAY BE LIMITED TO MAJOR STRUCTURAL AND EQUIPMENT ITEMS. FINAL DETERMINATION OF CONFIGURATION WILL BE MADE BY AGREEMENT BETWEEN AGENA D PROGRAM DIRECTOR, THE USING MILITARY PROGRAM DIRECTOR AND LMSC. (O) NECESSITY FOR ENGINEERING ANALYSIS REPORTS TO BE DETERMINED BY AGENA D PROGRAM DIRECTOR.✓ (P) QUALIFICATION STANDARDS AND SPECIFICATIONS ARE TO BE DETERMINED AND AGREED TO BETWEEN LMSC, THE AGENA D PROGRAM DIRECTOR AND THE USING MILITARY PROGRAM DIRECTORS. PART IV. (A) AGENA D MANUFACTURING COMPLETION SCHEDULE FOR INITIAL TWELVE VEHICLES - 1962 MARCH (1), APRIL (1), MAY (2), JUNE (2), JULY (2), AUGUST (3), SEPT (1). (B) LAUNCH DATES FOR INITIAL TWELVE AGENA D VEHICLES 1962 JUNE (1), JULY (1), AUGUST (1), SEPT (2), OCT (3), NOV (1), DEC (1); 1963 JAN (1), FEB (1). PART V. FUNDING FOR AGENA D PROGRAM, DISCOVERER PROGRAM AND 4TH DISCOVERER LAUNCH PAD WILL BE COVERED BY SEPARATE COMMUNICATIONS. PART VI. DOCUMENTATION UNDER AFR 80-2 AND AFR 375-4 WILL NOT BE REQUIRED. A PROGRAM PLAN SHOWING MAJOR MILESTONES, SCHEDULES, LAUNCH DATES AND LMSC AND SSD ORGANIZATION AND PROCEDURES WILL BE SUBMITTED TO HQ USAF ATTN: AFSSV-EQ

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BY 15 DEC 1961. A BRIEF MONTHLY REPORT SHOWING PROGRESS AND HIGH LIGHTING PROBLEM AREAS WILL BE SUBMITTED TO HQ USAF BEGINNING 1 JAN 1962. PART VII. (A) TOOLING AND MANUFACTURING TEST EQUIPMENT WILL BE PROVIDED FOR PRODUCTION RATE OF 3 to 5/MONTH. FINAL DECISION ON RATE TO BE MADE AFTER ANALYSIS LMSC RESPONSE TO SSD REQUEST FOR PROPOSAL DUE MID-DECEMBER. (B) ACTUAL PRODUCTION WILL BE PER CONTRACT SCHEDULE. (C) FY-62 AND FY-63 FACILITY REQUIREMENTS FOR INITIAL TWELVE VEHICLE PROGRAM AND SUSTAINING RATE OF 3 TO 5/MONTH WILL BE IDENTIFIED ASAP AND FORWARDED TO HQ USAF. PART VIII. INITIAL CONTRACT WILL INCLUDE STUDY USE AGENA D WITH TITAN III BOOSTER. FUNDS FOR THIS STUDY WILL BE MADE SUBJECT OF A SEPARATE CONTRACTUAL AND FUNDING LIMITATION. RESULTS OF STUDY WILL BE INCLUDED IN TITAN III SYSTEM PACKAGE PROGRAM TO BE SUBMITTED THIS HEADQUARTERS LATE JANUARY 1962.
BT
30/1910Z NOV RJEZHQ

IC 15572

~~SECRET~~

HEADQUARTERS
OFFICE OF THE DEPUTY COMMANDER AFSC
FOR AEROSPACE SYSTEMS
UNITED STATES AIR FORCE
Air Force Unit Post Office, Los Angeles 45, California

REPLY TO ATTN OF: DCAPO-1

SUBJECT: 662A Directorate (Agena-D)

DEC 18 1961

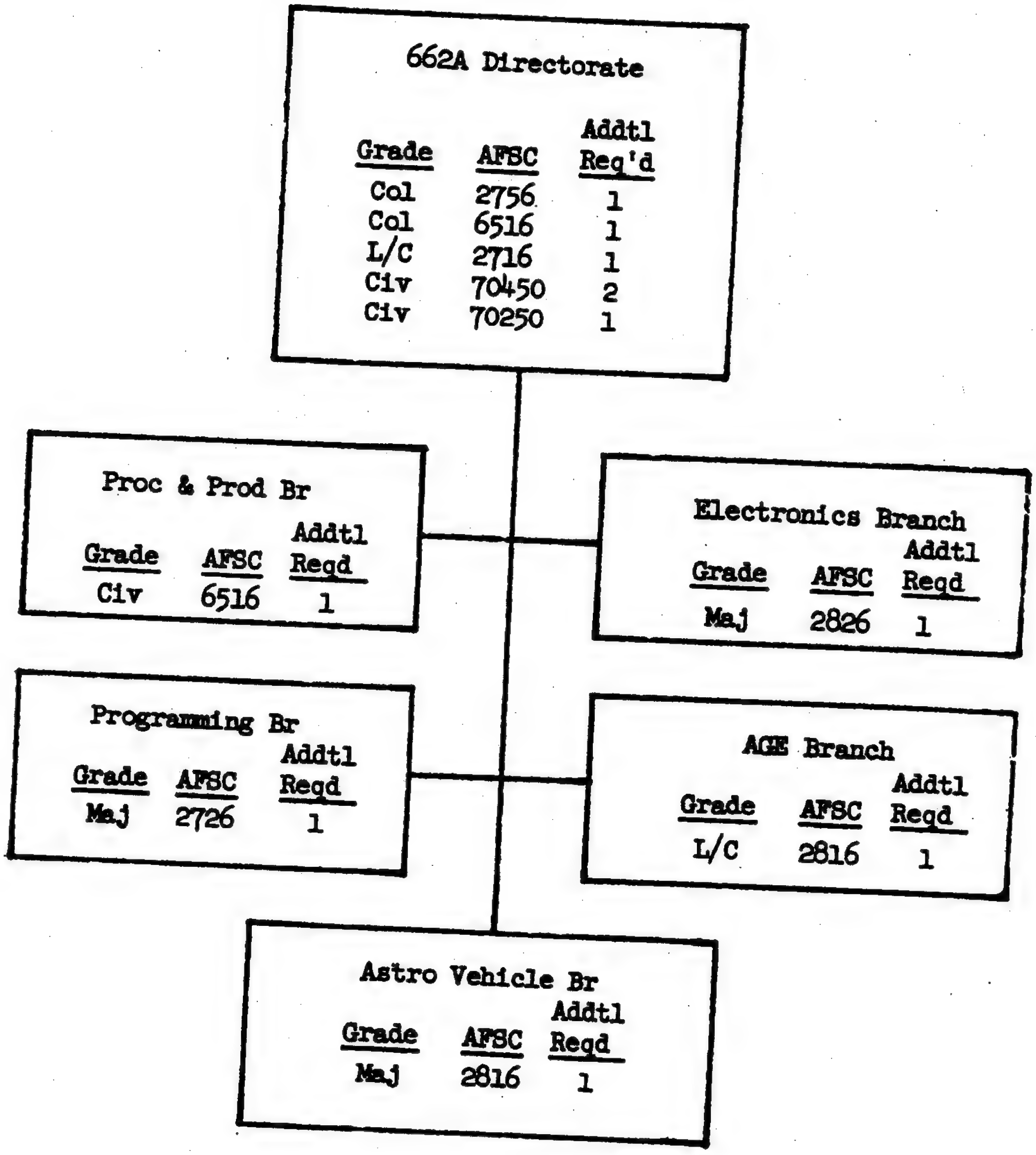
TO: SSLO

The attached organization, additional manpower requirements and functions for the Agena-D Program are approved. Complete documentation and justification will be forwarded to Hq AFSC (SCPOM) within the next ten days.

Donald D. Hoover

DONALD D. HOOVER
Lt Colonel, USAF
Chief, Manpower & Orgn Branch

2 Atch
1. Orgn Chart
2. Functions



662A Directorate

Grade	AFSC	Addtl Req'd
Col	2756	1
Col	6516	1
L/C	2716	1
Civ	70450	2
Civ	70250	1

Proc & Prod Br

Grade	AFSC	Addtl Reqd
Civ	6516	1

Electronics Branch

Grade	AFSC	Addtl Reqd
Maj	2826	1

Programming Br

Grade	AFSC	Addtl Reqd
Maj	2726	1

AGE Branch

Grade	AFSC	Addtl Reqd
L/C	2816	1

Astro Vehicle Br

Grade	AFSC	Addtl Reqd
Maj	2816	1

RECAP

Col	2
Lt Col	2
Maj	3
Civ	4

662A DIRECTORATE

FUNCTIONS

SYSTEM PROGRAM DIRECTOR

Management responsibility for planning, organizing, integrating, coordinating and monitoring the Agena D Program. Responsible for the overall Air Force management, controls and directs the efforts of functional agencies and industries participating in the 662A Program.

PROCUREMENT AND PRODUCTION BRANCH

Responsible for procurement and production management functions for the Agena D vehicle and associated aerospace ground equipment. Translates program requirements into contractual work statements; plans, negotiates, contracts for funds; and administers procurements. Monitors the production and installation status of program equipments. Performs management-level production expediting.

ELECTRONICS BRANCH

Responsible for providing auxiliary power, guidance and flight control for the Agena D. Determines secondary power, guidance and control requirements for the Agena D. Reviews development plans, programs, and specifications to insure that requirements are properly reflected. Directs and supervises development progress of contractors to insure the technical adequacy and timely delivery of secondary power, guidance and control techniques and hardware for the Agena D. Conducts liaison with military and civil agencies to determine and make use of other approaches and solutions to guidance, control, and secondary power problems.

AEROSPACE GROUND EQUIPMENT BRANCH

Responsible for the Air Force management of contractor-s engineering efforts during the design, development and test of Agena D aerospace ground equipment and special test equipment to insure the technical adequacy and timely delivery of the equipment to support Air Force programs. Also responsible that vehicle test philosophy and procedures and the checkout equipment are compatible and will during vehicle tests, provide adequate technical data to permit acceptance of the Agena D vehicle.

PROGRAMMING BRANCH

Responsible for establishing Agena D program requirements based upon the official Air Force Integrated Launch Schedules published by SSD; providing budget information to program offices pertaining to fund requirements for program 662A and for availability of funds for release to the contractor.

ASTRO-VEHICLE BRANCH

Responsible for the engineering development and technical management of the Agena D vehicle structure, its propulsion and re-entry system and techniques. Establishes and supervises programs for development and continuing product improvement to meet the requirements of all programs using the Agena D. Conducts periodic technical design review meetings to evaluate contractor's approaches and methods of doing work. Reviews engineering and development schedules and progress to assure that Air Force requirements and objectives will be met. Maintains close liaison with interested program office and contractor personnel to identify and solve subsystem interface problems. Participates in reliability programs applicable to the Agena D vehicle.

APPENDIX C

TECHNICAL DESCRIPTION

THE AGENA D

DESIGN CONCEPT

The design concept of the Agena D is to provide a program office with a standardized ascent or orbital vehicle that is reliable, easily adapted to program requirements, and easily maintained. This concept is achieved by making maximum use of previously developed Agena vehicle equipment, by further simplifying the overall design, incorporating modular construction, simplifying procurement and manufacturing procedures, and minimizing the testing operation. The result will be an improved Agena at lower cost to the customer.

The basic Agena D will be delivered to the using programs as a tested flight-ready vehicle. The addition of optional equipment and mission-peculiar items by the using programs will provide a vehicle capable of satisfying a variety of ascent and orbital requirements. The basic vehicle divides into the following assemblies: the forward section, the propellant tank section, the aft section, and the adapter section.

VEHICLE DESCRIPTION

MECHANICAL

STRUCTURAL

Agena D Forward Section

The forward section is essentially the same length and utilizes the same corresponding stations as Agena B; however, it employs an entirely different structural concept based on modular equipment installations. Complete components, such as the guidance module, are removable and can be replaced as a unit. The design concept is such that maintenance will be performed by removing and replacing either the module or a component of the module, rather than opening a component for repair. Removable panels and hinged doors provide the desired accessibility to all rack mounted equipment. The structural design of the vehicle permits ground handling without the doors installed.

Consistent with the basic concept of modular design, related items are grouped together. Components requiring mutual alignment will be assembled in a module for bench alignment prior to vehicle installation. Alignment with the vehicle axis will be achieved by a machined installation fit.

Similar electronic equipment and subsystem components are packaged by modules. These modules are: telemeter module in the communication bay, the plumbing module in the pressurization bay, the electrical module in the electrical bay, the guidance module located at the bottom of the forward rack. A minimum volume sphere is provided with the basic vehicle but space permits installation of a large one if required by the using program.

Interface with the payload is accomplished at the forward ring of the forward rack. Mechanical interface is provided by a machined surface on the forward ring and 8 bolt holes. Electrical interface with the payload is facilitated by locating connector receptacles in cable and connector flanges in the forward section of the forward rack.

Propellant Tank Section

The propellant tank section is essentially the same as the present Agena. The fuel and oxidizer tanks have the same capacity as the Agena B tanks. Two external fairings, extending the full length of this section, cover the plumbing and electrical lines. These fairings are located on the top and bottom longitudinal axis of the vehicle.

Aft Section and Adapter

The aft mid-body structure extends from the rear tank joint to the booster adapter separation plane. The engine thrust cone structure is attached to the aft mid-body and provides support for this aft equipment rack, and engine loads. The engine is the BAC 8096 used in the present Agena. Clearance is provided in the aft bulkhead to permit 2 1/2 degrees of motion for gimbaling the engine.

The turbine exhaust duct has been modified slightly to improve the space allocation in this area. The structural configuration of the aft equipment rack is readily adaptable to different flight missions. For orbital missions side racks can be installed to support equipment trays. For ascent missions requiring less equipment, these racks may be removed. If solar arrays are required by the using program, the side racks are replaced by longitudinal struts to which the solar arrays are attached.

A variety of different sized control gas tanks are available as optional equipment. This gives the using program the opportunity to select the best configuration for a particular mission. Space and mounting arrangements are available for several different arrangements.

In a similar manner, additional batteries can be mounted on the aft equipment rack.

The booster adapter supplied as part of the Basic Agena D is compatible with the Thor DM21. As optional equipment, a skirt assembly can be attached to the basic adapter to mate the Agena with the Atlas booster. Access doors are provided in the adapter to reach the separation rails and rollers. Four separation rails are provided in the Agena D. The four rack configuration provides the best arrangement for the aft equipment rack to accommodate solar arrays or other program-peculiar equipment.

PROPULSION

Propulsion System

This system is designed to simplify installation and replacement of all propulsion packages and components. The forward equipment rack provides for a plumbing module. This module can be removed by disconnecting pneumatic and electrical lines and removing the mounting screws. The module contains the orifice fed pressurization system package and the propellant tank vent quick-disconnect couplings. Plumbing joints are kept to a minimum and are either brazed or welded, where possible, to minimize leakage.

Basic Propulsion Equipment

The following propulsion equipment comes with the basic Agena D. The main engine is a BAC 8096, the same as in the present Agena. This engine is equipped for two starts.

The Oxidizer Pump Lip Seal Pressure Package

This package contains a multiple-squib-operated shut-off valve, pressure regulator and pressure relief valve. This equipment is located in the aft rack and is pressurized by guidance control gas.

Propellant Feed and Load System

The propellant loading lines attach to propellant isolation valves for delayed restart missions. Substitute tubes will be placed in the space occupied by the isolation valves for missions requiring delayed restart. These tubes will be in the shape of tees with propellant ports located identically to those in the isolation valves. These parts would then be interchangeable without modifying adjoining lines. The propellant dumping port is located between the propellant quick-disconnect and the fill bellows.

Propellant Pressurization System

The basic pressurization system contains the filters, motor operated pressurization valve (which incorporates the orifices), and the associated tubing. This pressurization package will fit into the basic plumbing module in the forward equipment rack. A high pressure gas sphere will be supplied for propellant tank pressurization. The sphere will have a minimum volume of 1612 cubic inches and an operation pressure of 2500 psi, and will be attached to a bracket mounted in the forward rack. Space is provided for a larger (3653 cubic inches) pressure (2500 psi) sphere if required by the using program.

Pressure Relief Package and Remote Abort Capability

The design incorporates the ability to depressurize the helium sphere remotely in the event that the umbilicals fall off prematurely. This is a portion of the safe abort system.

Solid Propellant Ullage Rockets

Four solid propellant ullage rockets will be provided on the aft equipment rack. If only single burn is planned, the extra set of ullage rockets may be removed. Thermal shielding will be provided on the second set of ullage rockets because of their nearness to the radiation cooled nozzle of the main engine.

Optional Propulsion Equipment

The following equipment is optional for using program choice.

Booster Retro Rockets

These booster retro rockets are considered as optional equipment because they will have to be supplied by the Agena D for all programs using Thor boosters. For those programs using Atlas boosters they are supplied by the Atlas.

Rapid Propellant Dumping System

The propellant dumping system will provide for in-flight expulsion of propellant in liquid form. This system fits into the propellant feed line between the quick-disconnect and the fuel bellows. A line will lead to the port in the fuel system through a squib-operated valve and out to the end of the aft rack. The aft end of this line will be flexible to allow for alignment with the center of gravity of the vehicle.

Secondary Propulsion System

The Agena D provides for mounting and electrical operation of a secondary propulsion system in the aft equipment rack.

Delayed Engine Restart Package

This package will contain an auxiliary lubrication system, propellant shutoff valves, and quick-disconnect coupling shutoff valves. The propellant and pressurization system will be isolated from the vacuum environment at the end of first burn. The propellant shutoff valves are opened just prior to second burn.

7

CONTROL SYSTEM

Pneumatics System

The pneumatic system will have the pulse valves while the pneumatic tanks would be chosen for a particular mission. The system will incorporate a squib-operated vent valve to be compatible with the requirement for remote abort capability. Note also that guidance control gas will be used for pressurization of the oxidizer pump lip seal.

Hydraulics System

The hydraulic power package is the fuel powered unit currently used with the 8096 engine. The servo valve and actuator combination is the unit currently used by Agena B and will receive its signal from the F/C electronics.

ELECTRICAL

Wiring Harness

The wiring harness will be installed in such a manner that any individual harness can be removed and replaced without disturbing the other harnesses. The separate power and pyrotechnic harnesses will be grouped together and routed together but kept separate from all other groups. Monitor and control harnesses and T/M low level harnesses will be grouped and treated in the same manner. Payload interface connectors will be provided in the forward end of the forward equipment rack. Connector pins will face out for easy inspection.

Electrical Power

The primary electrical system will consist of batteries, solid state DC to DC converter regulator, 400 cps three phase inverter and 400 cps single phase synchronized inverter. The central power supply will furnish unregulated 22-29.3 VDC, regulated ± 28.3 VDC and 400 cps single and three phase 115 VAC. Provision will be made for installation of batteries in the forward and aft sections and the quantities and types of batteries will be determined by the using program. Brackets for installing solar arrays and batteries will be provided as required in the aft section. The payload will receive unregulated DC voltage and 400 cycle single phase and 3 phase voltages at the interface section in the forward section.

Destruct System

The self-destruct unit will be basic equipment installed in the booster adapter. This system is the same as the one in present Agenas.

ELECTRONIC

COMMUNICATIONS AND CONTROLS

The equipment comprising the electronic group will satisfy vehicle functional requirements of T/M, acquisition, tracking, command and RF promogation. In cases of optional equipment such as S-band, C-band and other beacons, and alternate PAM and FM T/M systems, common mounting locations and electrical interface will be provided so that the vehicle will readily accept the components selected by the using program. Optional items will be provided with necessary pendant cabling, plugs, etc., to permit ready adaptability to Agena interface connections.

Basic C&C Equipment

Two alternate telemeters are considered for use in the Agena and are FM/FM Unitized Type II and the PAM General Purpose. Each telemeter will be mechanically and electrically interchangeable without modification to the vehicle. The FM/FM telemeter will consist of VCO's, commutator, signal conditioner, program module, and power switch calibration unit configured to satisfy vehicle ascent functions with minimal on orbit capability. The alternate General Purpose PAM telemeter incorporates 16 main multiplex channels totaling approximately 40 KC of information bandwidth. Repackaging of the PAM telemetery system is contemplated. This would eliminate numerous interconnection cables and connectors and reduce total weight to approximately 11 pounds, and the volume would reduce from 1300 to less than 275 cubic inches.

Optional C&C Equipment

The VHF transmitter TR-10 and associated power amplifier PA-10 are the best presently available and qualified items for this function; however, it should be understood that this system is not genuinely desired because of moderately overrated components which results in severely limited operating life time. Several solid state transmitters and RF amplifiers are being investigated, one of which may be available in the near future. This equipment will enhance reliability and eliminate requirement for associated DC/DC converters. The acquisition transmitter is the same as presently used on the majority of present vehicles. The beacon system shall be S-band, C-band or 400 mc as required by the specific mission. Each shall have identical interfaces to permit installation and operation without alteration to equipment or vehicle. The beacon system shall be capable of azimuth, elevation, and/or range tracking as well as limited real-time command. The interim programmer furnishes stored commands for on-orbit use. The programmer can be adjusted in position or period via the beacon system. It is only required for on-orbit missions to program equipment on and off, or as an ordinary timer for ascent missions where long duration transfer ellipse is required on escape missions. A new power control unit is being developed for Agena D use. It will consist of one basic and three plug-in modules. The plug-ins are associated with specific alternate or optional equipment and may be removed or retained consistent with configuration requirements. Space is provided for either an S-band, C-band, or 400 mc beacon ascent antenna. The 400 mc antenna, the largest of the three, determines the maximum volume required. An adapter plate is employed to satisfy installation requirements for S and C-band antennas, or in cases where no ascent antenna is used.

Instrumentation

A minimum basic list of instrumentation measurements is established. This optimum list of parameters will provide complete verification of the primary Agena D flight objectives. A detailed diagnostic capability has been purposely omitted in order to align the data-gathering concept with the Standard Agena design philosophy. These select measurements will not only supply adequate operational data, but will greatly reduce the complexity, calibration, test time, and cost of the C&C system, i.e., the type and location of basic instruments and transducers will be identical from vehicle to vehicle and will consequently lend well to production level technique and installation.

GUIDANCE

Guidance and Control

The basic guidance and control sensors will be mounted on a special supporting structure which accommodates the IRP, the horizon sensor, the velocity meter acceleromater, electronics, and counter, and the power supply. The principal purpose of this module is to combine the basic guidance and control items on a common support so that they may be bench aligned and then installed in the vehicle as a unit, with the module mounting closely controlled to provide inherent alignment to the vehicle geometric axes. The gas valves and hydraulic servos will be mounted to the same vehicle geometric axes as the sensors.

Basic Guidance and Control Equipment

Horizon Sensors

The horizon sensor provided as basic equipment will be the Barnes model. The H/S will be capable of viewing the horizon from either the horizontal or vertical position and thus, will accommodate horizontally oriented vehicles as well as nose up or nose down vertically oriented vehicles.

Inertial Reference Package

The IRP receives torquing signals from the H/S, and/or fixed torquing commands through the flight controls J-box; with appropriate switching being commanded by the timer. The time dependent parameters will be switched through the flight controls J-box as well as the introduction of operational signals, such as roll-yaw steering. The IRP will have the MIG roll gyro for improved yaw control on orbit for horizontally oriented vehicles. For the vertically oriented vehicles (controlled by the gas jet

)

system for long periods of time) the HIG yaw gyro would perform the gyro compassing. Although the yaw accuracy is degraded by this procedure , the vehicles involved have loose attitude requirements. The IRP has the capability of accommodating the roll-yaw steering unit as well as having the gyrocompass mode with gyro feedback. The IRP will have sufficient inputs to the torquer amplifiers to accomplish all mission functions.

Flight Control Electronics

The flight controls electronics will perform the function of amplifying and shaping error signals and applying these signals to the hydraulic servo or to the pulse gas valves. The input signals to the F/C electronics will be obtained from the IRP or, optionally, from the CMGs. The range of F/C parameters and program interconnects will be established in the Flight Controls J-box patch panel and will be switched by means of the timer. The output of the F/C electronics for the gas jet system will be the pulse modulated signals.

Flight Controls J-Box

The Flight Controls J-Box replaces the Primary Junction Box and will serve as a signal processer. A patch panel is provided on this J-box to allow the using program to adapt the Agena D to their requirements and mission. This patch panel establishes the system sequence of events, gains, time constants, deadbands, and programmed rates while the interconnects shall connect H/S to gyro torquers with the correct phasing, gyro feedback and cross-coupling, BTL guidance signals to timer and velocity meter, or GE guidance signals to timer. In addition, other patch connections will interconnect the signals of the optional equipment to the basic equipment, such as roll-yaw steering to IRP and roll-yaw steering to T/M, CMG to F/C electronics, H/S to PRW. These functions are in addition to the normal functions of signal and power switching performed in conjunction with timer commands.

Velocity Meter

The velocity meter will be the lightweight unit with the rotatable mount.

Timers

The primary timer chosen is the lightweight, 6000 sec. unit. Auxiliary timers would be used as required by the vehicle mission. The timer settings will be set for each mission by the using program.

Optional Guidance & Control Equipment

The optional equipment would include timers for recovery or orbital period adjust and would be used to satisfy a particular program function.

The pitch reaction wheel system and control moment gyros will be installed in the vehicle as optional equipment. The patch panel will provide the necessary interconnects for these units, as well as provide for the possibility of applying a steady torqueing signal to the torquer of a CMG (for possible use with "V" CMG system). The roll-yaw steering unit required in some programs provides pre-programmed vehicle attitude control and will be connected to the flight control system through the flight control J-box. It is controlled by the interim programmer through the command system.

TEST & CHECKOUT

AGENA D TEST AND CHECKOUT PLANS AND PROCEDURES

The Agena D program will be responsible for test and checkout of the Basic vehicle. This responsibility extends through the basic vehicle DD250 sell-off to the customer. At this point, the using program assumes responsibility, installs optional equipment, program peculiar equipment (which includes the payload, if required) and carries out a second DD250 sell-off. Although Agena D program responsibility ends with the first DD250, the design concept and test philosophy for the vehicle will greatly influence the manner in which the using programs conduct additional tests. Consistent with the vehicle design concept of interchangeability and easy access, the test and checkout equipment will not have diagnostic capability below the module/black-box level. A malfunction of a major piece of vehicle equipment will require a "plug-in" type replacement of the malfunctioning unit. The test equipment will be of the automated "go, no-go" type. The test plan does not include the hot firing of any of the production Agena D vehicles at SCTB. However, a Development Test Vehicle will be hot fired at SCTB for development and dianostic test of single start, dual burn and delayed restart modes of operation. Various combinations of optional equipment will be installed during this program. By the end of the DTV program, all optional equipment will have been qualified with the vehicle during a hot firing. Launch base testing, to fully utilize the time saving potential of this simplified vehicle, will be of the "go, no-go" type also. Malfunctioning units will be removed and replaced. The faulty units will be returned to the appropriate factory for repair.

The pitch reaction wheel system and control moment gyros will be installed in the vehicle as optional equipment. The patch panel will provide the necessary interconnects for these units, as well as provide for the possibility of applying a steady torqueing signal to the torquer of a CMG (for possible use with "V" CMG system). The roll-yaw steering unit required in some programs provides preprogrammed vehicle attitude control and will be connected to the flight control system through the flight control J-box. It is controlled by the interim programmer through the command system.

TEST & CHECKOUT

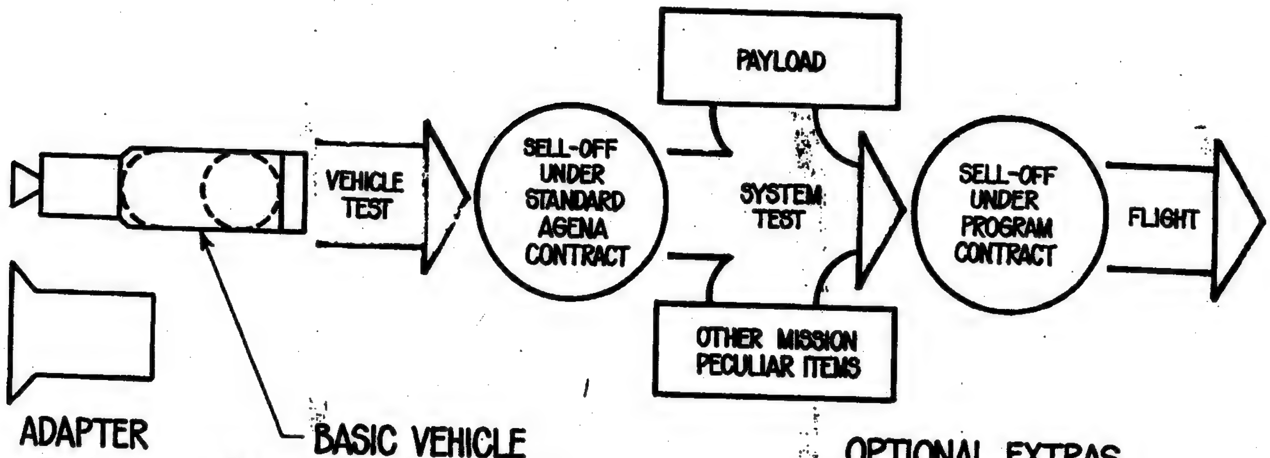
AGENA D TEST AND CHECKOUT PLANS AND PROCEDURES

The Agena D program will be responsible for test and checkout of the Basic vehicle. This responsibility extends through the basic vehicle DD250 sell-off to the customer. At this point, the using program assumes responsibility, installs optional equipment, program peculiar equipment (which includes the payload, if required) and carries out a second DD250 sell-off. Although Agena D program responsibility ends with the first DD250, the design concept and test philosophy for the vehicle will greatly influence the manner in which the using programs conduct additional tests. Consistent with the vehicle design concept of interchangeability and easy access, the test and checkout equipment will not have diagnostic capability below the module/black-box level. A malfunction of a major piece of vehicle equipment will require a "plug-in" type replacement of the malfunctioning unit. The test equipment will be of the automated "go, no-go" type. The test plan does not include the hot firing of any of the production Agena D vehicles at SCTB. However, a Development Test Vehicle will be hot fired at SCTB for development and dianostic test of single start, dual burn and delayed restart modes of operation. Various combinations of optional equipment will be installed during this program. By the end of the DTV program, all optional equipment will have been qualified with the vehicle during a hot firing. Launch base testing, to fully utilize the time saving potential of this simplified vehicle, will be of the "go, no-go" type also. Malfunctioning units will be removed and replaced. The faulty units will be returned to the appropriate factory for repair.

SYSTEM DESCRIPTION

17-4-74

AGENA D CONCEPT


PAYLOAD
VEHICLE TEST
SELL-OFF UNDER STANDARD AGENA CONTRACT
SYSTEM TEST
SELL-OFF UNDER PROGRAM CONTRACT
FLIGHT
OTHER MISSION PECULIAR ITEMS
ADAPTER

BASIC VEHICLE

ASCENT VEHICLE

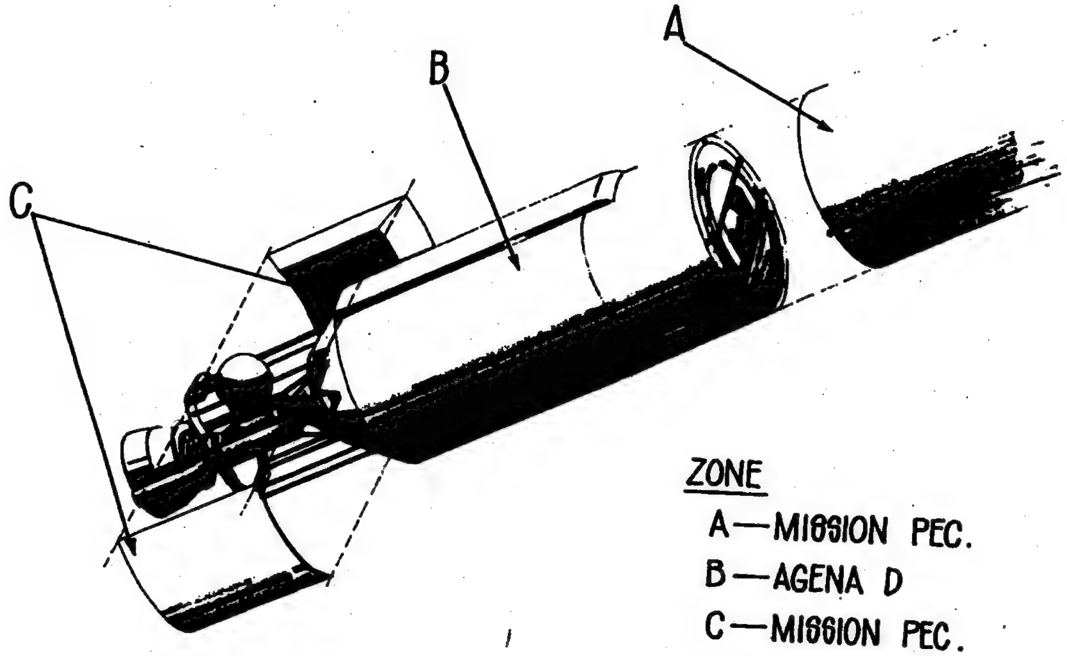
- FRONT RACK, TANK & AFT RACK
- 8096 ENGINE RESTARTABLE
- GUIDANCE & CONTROL FOR ASCENT
- TELEMETRY FOR ASCENT
- BRACKETRY, CABLING JUNCTION BOXES

OPTIONAL EXTRAS

EXAMPLES

- NOSE FAIRING
- SECONDARY PROPULSION SYS.
- EXTRA BATTERIES & GAS BOTTLES
- CONTROL MOMENT GYROS
- BEACONS, PROGRAMMERS
- BRACKETRY, CABLING JUNCTION BOXES

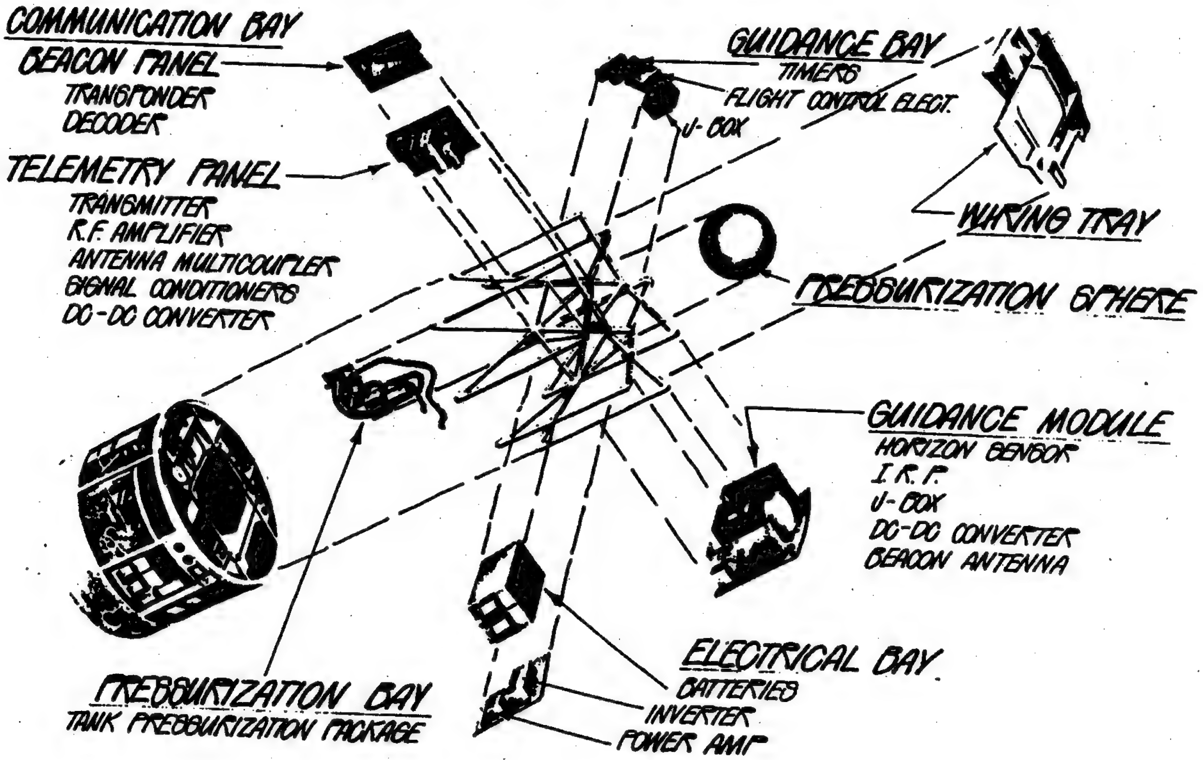
AGENA D MECHANICAL



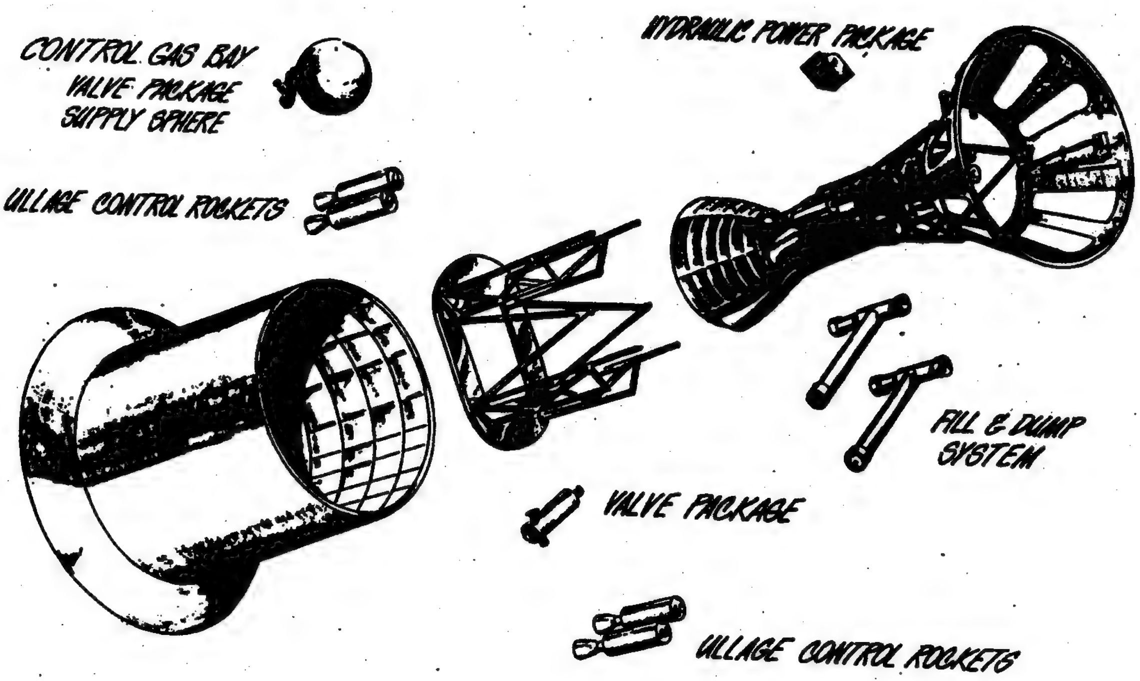
ZONE

A—MISSION PEC.
B—AGENA D
C—MISSION PEC.

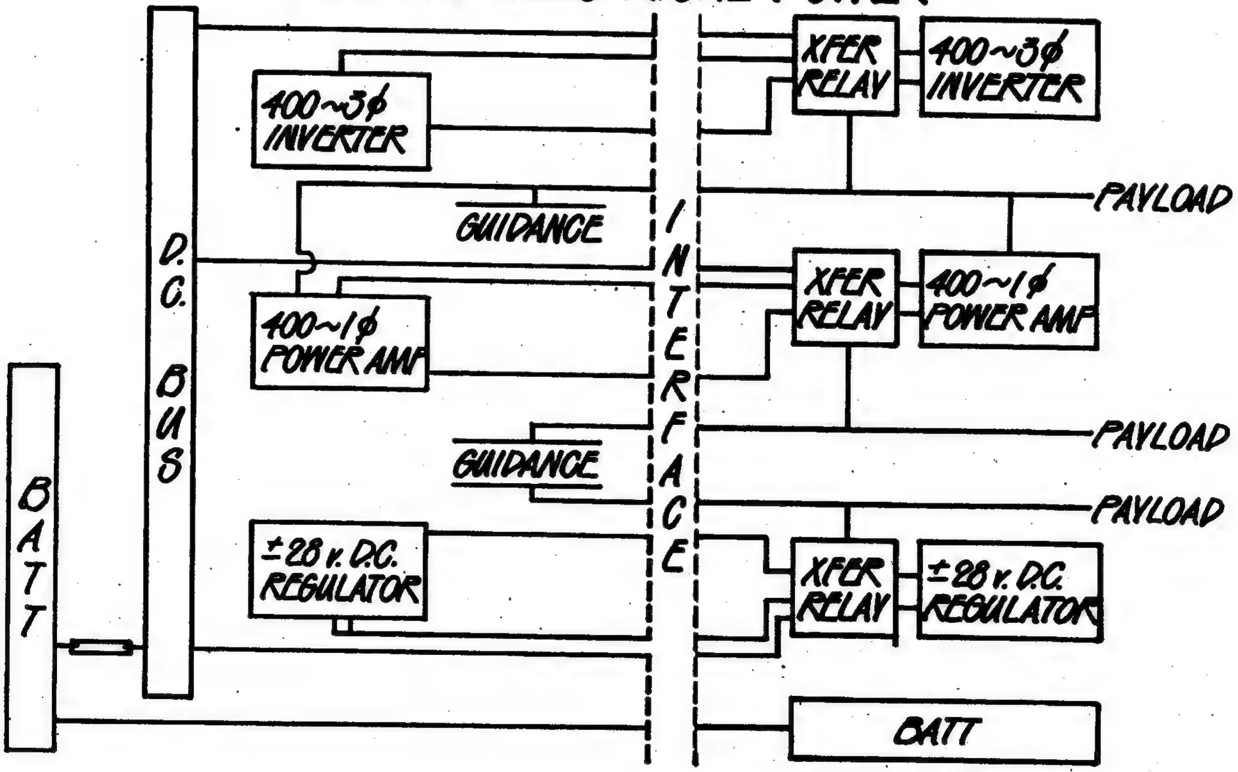
AGENA D FORWARD EQUIPMENT RACK



AGENA D AFT EQUIPMENT RACK AND ADAPTER

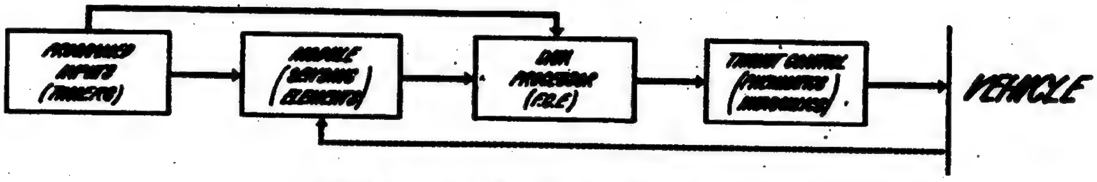


AGENA D ELECTRICAL POWER

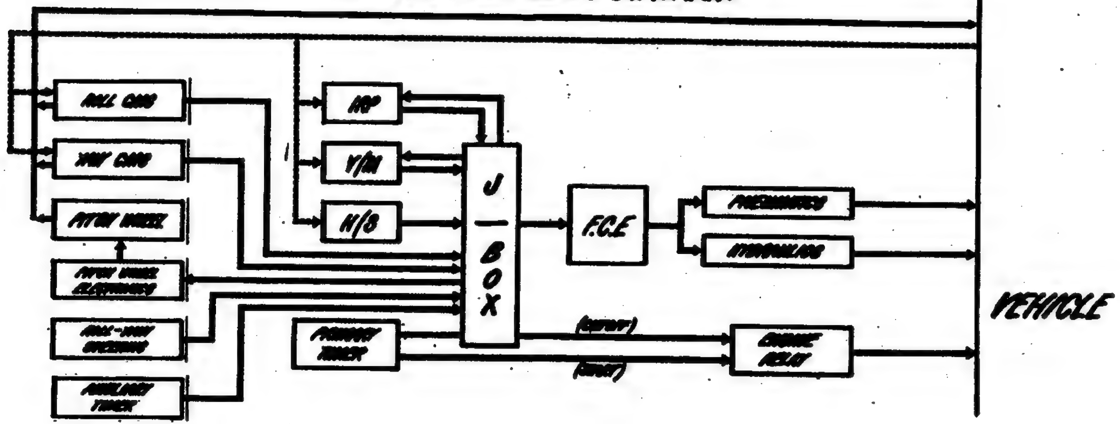


AGENA D GUIDANCE & CONTROL

SIGNAL FLOW DIAGRAM


PROGRAMMED INPUTS (TIMERS)
VARIABLE (SENSING ELEMENTS)
DATA PROCESSOR (F.C.E)
THRUST CONTROL (PNEUMATICS HYDRAULICS)
VEHICLE

SIMPLIFIED BLOCK DIAGRAM



12-4-74

AGENA "D" AGE/STE

DEFINITION: FACTORY LOCATED HANDLING AND CHECKOUT EQUIPMENT (MANUAL & AUTOMATIC) REQUIRED THRU DD 250 ACCEPTANCE OF AGENA D.

FUNCTION: TO PERFORM AN INTEGRATED SYSTEM CHECKOUT OF THE AGENA D. THE AUTOMATIC EQUIPMENT (FACE) IS SCHEDULED FOR USE ON THE 18TH AGENA D.

CHECKOUT EQUIPMENT MODIFICATIONS
(EQUIPMENT LOCATED FACTORY, AMR, PMR)

- GUIDANCE SUB SYSTEM C/O EQUIPMENT - CHANGE IN GUIDANCE SYSTEM
- SYSTEM COMPLEXES
  - SIGNAL DISTRIBUTION & MONITOR CONSOLE
  - CONTROL & INDICATOR CONSOLE
- MINOR MODS TO BOTH SYSTEM & SUBSYSTEM CHECKOUT EQUIPMENT
- PROGRAMS AFFECTED -

DISCOVERER	102
NASA (AMR)	NASA (PMR)
MIDAS	SNAPSHOT
ADVENT	

201
VELA HOTEL } MINOR
621A

ESTIMATED COST 1.8

HANDLING & SERVICING EQUIPMENT

EQUIPMENT LOCATED FACTORY, AMR, PMR, TRANSITORY

NEW

- **HANDLING YOKES**
  DIMENSIONAL CHANGES IN THE VEHICLE FAIRING SIZE AND LOCATION.
- **YOKE REMOVAL SLINGS**
  RELOCATION OF FAIRINGS ON VEHICLE CAUSING RELOCATION OF PICK UP POINTS.
- **BOOSTER ADAPTER PROTECTIVE COVER**
  INCREASED LENGTH OF ADAPTER
- **GUIDANCE MODULE CONTAINER**
  NEW GUIDANCE MODULE

MODIFICATIONS

- **VEHICLE TRANSPORTER**
  CHANGE IN YOKE SPACING ALONG LONGITUDINAL AXIS
- **VEHICLE HANDLING DOLLY**
  SAME AS ABOVE
- **BOOSTER ADAPTER HANDLING DOLLY**
  INCREASED LENGTH OF ADAPTER
- **VERTICAL WORK STAND**
  RELOCATION OF FAIRINGS

PROGRAMS AFFECTED

- DISCOVERER
- 201
- NASA AMR
- VELA HOTEL
- ADVENT
- 102
- MIDAS
- NASA PMR
- 621 A
- SNAPSHOT

ESTIMATED COST 95M

LAUNCH STAND EQUIPMENT MODIFICATIONS

- LAUNCH CONTROL
  - ELECTRICAL & GUIDANCE CONSOLE — CHANGE IN GUIDANCE SYSTEM
  - PNEUMATIC & PROPULSION CONSOLE — ADDITIONAL TEMPERATURE & PRESSURE MONITORING
  - UMBILICAL PLUG, ELECTRICAL — CHANGE IN PIN/FUNCTION ASSIGNMENT
  - TEST PLUGS — CHANGE IN PIN/FUNCTION ASSIGNMENT
  - COMMUNICATIONS CONSOLE
  - R.F. % CONSOLE
  - PAD SIGNAL PROCESSING SET

  } — MINOR MODS
- GROUND SERVICING
  - UMBILICAL SYSTEMS INSTALLATION — RELOCATION OF QUICK DISCONNECT COUPLINGS
  - PROGRAMS AFFECTED -

DISCOVERER 102 NASA	COMPLEX 75-1, PAD 1-PMR 75-3, PADS 4,5-PMR
MIDAS 201	PALC *1, PADS 1,2-PMR
NASA ADVENT	STAND 12 AMR

ESTIMATED COST 2.13 M (LESS UMBILICAL SYSTEM)

AGE SUMMARY

1. NON- AGENA "D" CONTRACT AGE COSTS - 4.88M
2. NUMBER OF LAUNCH PADS REQUIRING MODS - 6
3. NUMBER OF SYSTEM CHECKOUT COMPLEXES REQUIRING MODS - 8
4. NUMBER OF PROGRAMS AFFECTED - 10

DIVISION OF RESPONSIBILITY BETWEEN AGENA "D" AND PROGRAM CONTRACTS

AGENA "D"

FACTORY LOCATED EQUIPMENT THRU AGENA "D". DD 250	C-5-MOD OF MANUAL EQUIPMENT C-3-MOD " " " FACE-NEW AUTO EQUIPMENT HANDLING EQUIPMENT

PROGRAM

FACTORY LOCATED AGENA "D" DD 250 THRU SATELLITE SYS DD 250	C-6 C-9 C-12 C-3 C-11 C-7 C-5A C-1A } MOD OF MANUAL EQUIPMENT HANDLING EQUIPMENT
LAUNCH BASE EQUIPMENT	C-10

	PALC #1	PAD 1
		PAD 2
HANDLING EQUIPMENT	TS-1	PAD 1
	TS-3	PAD 4
		PAD 5
		STAND 12 (AMR)

ALL NEW SYSTEM % COMPLEXES WILL BE UNDER PROGRAM CONTRACTS.

12-4-24

AGENA D OPTIONAL EQUIPMENT LIST

- STRUCTURE
  - SKIRT ASSY-ADAPTER (ATLAS)
  - DIAPHRAGM, FORWARD PRESSURE
  - TIE ROD ASSEMBLIES, BATTERY INSTALLATION
- PROPULSION
  - SYSTEM INSTALLATION, PROPELLANT DUMP
  - KIT, DELAYED RESTART
  - ROCKET, RETARDING
- ELECTRICAL
  - METER, AMPER HOUR
  - BATTERY, PRIMARY, TYPE I
  - BATTERY, PRIMARY, TYPE IV
  - BATTERY, PRIMARY, TYPE VI-A
- GUIDANCE & CONTROL
  - TIMER, SEQUENCE
  - TANK ASSY, GAS STORAGE (1728 CU. IN.)
  - TANK ASSY, GAS STORAGE (2200 CU. IN.)

AGENA D OPTIONAL EQUIPMENT LIST (CONT'D)

- **COMMUNICATIONS & CONTROL**
  - "S"- TRANSPONDER, RADAR BEACON, TRANSISTORIZED
  - "S"- DECODER, COMMAND, RADAR BEACON TRANSISTORIZED
  - TRANSPONDER, RADAR BEACON, C-BAND
  - COAXIAL SWITCH, SPDT TYPE TNC CONNECTOR
  - TRANSMITTER, VHF, ACQUISITION, 40 MW, OUTLINE & DMS
  - MULTICOUPLER, TWO-CHANNEL, VHF, TYPE I
  - FM/FM OSCILLATOR, SUB CARRIER, VOLTAGE CONTROLLED
  - FM/FM MOUNT ASSY, OSCILLATOR
  - FAIRCHILD PROGRAMMER, TYPE VI
  - ANTENNA ASSY, BEACON, S-BAND
  - ANTENNA ASSY, BEACON, C-BAND
  - 400 MC TRANSMITTER, DOPPLER TRANSPONDER
  - 400 MC RECEIVER, DOPPLER TRANSPONDER
  - 400 MC DIPLEXER, DOPPLER TRANSPONDER
  - 400 MC ANTENNA, ASCENT, 400 MC
  - VHF TRANSMITTER ASSY, TR-10
  - VHF AMPLIFIER ASSY, POWER, PA-10
  - KIT, DESTRUCT SYSTEM, COMMAND